

COMPUTERWORLD

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NEWSPAPER

A Special Report On Source Data Entry

Follows Page 52



Users Vote Key-to-Disk Best Bet for Data Entry

By Tom Henkel
CW Staff

ELLICOTT CITY, Md. — While some DPers dream of a day when voice data entry and superefficient terminals rule the roost, most do not hold much hope of seeing revolutionary data entry technology in the next few years.

DPers targeted key-to-disk as the data entry area with the most potential for the next three years. In addition, DPers feel IBM is the most likely candidate to provide improved key-to-disk technology, according to a recent survey.

Conducted by Impact Marketing Services, the survey was mailed to 250 DP managers and 500 data entry specialists. From

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Data Base Problems?

System/38 Hits New Snags

By Tom Henkel
CW Staff

ATLANTA — IBM is still having problems with software on its long-delayed System/38. Now it appears several program products will gobble up greater amounts of memory than originally announced by IBM's Gen-

eral Systems Division here.

While they appear to be centered in program products, the troubles lead some observers to believe there are still problems with the data base portion of the System/38 operating system — an integral part of the System/38.

The System/38's Display Information Facility, an on-line application development tool, has been delayed from May 1980 to May 1981. In addition, the minimum configuration for the facility has been changed from a Model 321 processor with 512K bytes of main memory and 64.5M bytes of disk storage to a Model 332 processor with 768K bytes of main memory and 129M bytes of disk storage.

That means it now takes 256K more bytes of main memory and an additional 64.5M bytes of disk storage to support the package. A minimum configuration of one line printer and an IBM 5251 Model 11 Display Station is still required to operate the package. Those two requirements are unchanged, according to IBM.

DMS/38 Improve, an on-line interactive inventory management and purchasing tool, has been delayed from July 1980 to July 1981. In addition, the package now requires a Model 332 processor plus 768K bytes of main memory and 129M bytes of

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Expecting Economic Dips, Some Sites Changing Plans

CW Staff Roundup

In spite of rampant inflation and a threatened recession, DPers appear to be weathering the economic storms well.

However, a sizable minority — from about one-fourth to one-third — of DPers surveyed by *Computerworld* last week said they have altered usual hiring patterns and equipment procurement methods in order to cope with the bad times anticipated ahead.

Of the 28 randomly chosen DP executives interviewed, only two said they have reduced the number of budgeted DP staff positions. In general, DP executives said they are maintaining or increasing current staff, with 21% modifying usual hiring practices.

In most of these cases, DP managers said they are using outside consultants in order to protect the jobs of in-house DPers in case of a near-term decline in the economic environment.

Procurement Plans Reconsidered

Aside from changes in hiring patterns, 32% of the users interviewed said they are trying, because of the current economic situation, to control costs by reconsidering plans for hardware outlays or revamping their schedules for hardware procurement.

Although turnover is a chronic condition in many DP shops, 29% of the respondents said they have noticed lower turnover rates recently, perhaps a harbinger of tighter economic conditions.

While these adjustments to current hiring and procurement methods were not reported by the majority of users surveyed, many executives observed that it is really too early to gauge the impact of any expected economic downturn. However, many indicated they would not feel the pangs of recession and/or stepped-up inflation until later this year or early next year.

One firm apparently already feeling the pinch of the current economic environment is Revere Sugar Corp. That firm had layoffs of up to 50% in three of its refineries, according to Ronald

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Recession To Spare DP?

By Tom Henkel
CW Staff

NEW YORK — A 1980 recession probably will not affect DPers as severely as the recession of 1973-1974, but DPers should be cautious during the next two quarters, an industry analyst here said last week.

Although much depends on the depth and length of the current recession, most DP shops will be spared its full impact. Since computers are often considered by management as productivity improvement tools, top brass may avoid DP department cuts in favor of other areas in the firm, according to Thomas Crotty, an analyst for the Gartner Group.

Comparing the current recession with similar conditions during 1973-1974, Crotty also noted the DP department has taken a stronger foothold in most corporations. That means cuts to the DP department would be difficult, if not impossible, for larger companies to swallow.

But even though the future for DPers may not look as bleak as for other workers, DPers, too, should stay aware of changes within their organizations, Crotty advised.

The next two quarters will not be the greatest time to be looking for a job in DP, according to Crotty. He

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Master Business, Managers Told

By Jeffrey Beeler

CW West Coast Bureau

MINNEAPOLIS — DP managers will have to master business as well as computing if they want to avoid losing their jobs during the 1980s, an NCR Corp. user warned here last week.

Job security for computing room heads no longer depends on technical competence alone, according to Peter Blozis, vice-president of H.J. Wilson Co.'s Information Services Division.

Today, with information ranking among the most valuable of all corporate resources and with computing rapidly coming of age as a business discipline, DP managers are acquiring a newfound stature within their organizations. No longer regarded as mere technicians, they are increasingly be-

(Continued on Page 8)

French DP Centers Burned, Terrorist Groups Take Blame

By Rex Malik
Special to CW

TOULOUSE, France — Two computer centers here were burned and their contents destroyed earlier this month — with two different terrorist groups claiming responsibility.

Damage included burned-out systems, client records, archives and programs, according to officials from both firms. Police officials said the attackers "knew what they were doing."

The centers, one operated by Philips Data Systems and the other by CII-Honeywell-Bull, Inc., were dedicated to routine business applications — not government contracts or applications with defense or other political overtones, according to both firms.

Responsibility for the attacks was

claimed by Action Group 27-28 March, believed to be linked with the Red Brigades of Italy, which was responsible for the assassination of Italian Prime Minister Aldo Moro, and by the Committee for the Liquidation and Neutralization of Computers (in French, Clodo).

'Systematic Campaign'

The Action Group indicated these attacks were the start of a systematic campaign to attack computer companies and computer centers in France.

Clodo echoed the Action Group's position in a statement to the newspaper *Liberation* in Paris, in which it claimed to represent "computer workers and [be] therefore well-placed to know the

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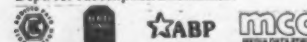
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'Newsday' CRTs Found Leaking Radiation; Metal Shields Installed to Protect Workers

By Ann Dooley

CW Staff

MELVILLE, N.Y. — Radiation emissions that exceed government-recommended safety levels were recently discovered leaking from CRT terminals at *Newsday*, a Long Island newspaper here.

Metal shields have been installed on the units, and no employees appear to have suffered any resulting health problems, according to a spokesman for the newspaper.

The *Newsday* machines at issue are Teleram Communications Corp. 2277 Mark 1 CRT terminals. As a precautionary measure, the Newspaper Guild has recommended to its locals that any employee working with a 2277 request that a metal shield be installed.

Charles Satuloff, Teleram president, maintained that the whole affair arose "due to a series of mismeasurements and lack of knowledge by others about government specifications." While admitting that *Newsday's* machines may have malfunctioned, he stressed that a test made by the Department of

Health Education and Welfare Department's Bureau of Radiological Health indicated no danger from the 2277s. The study's final conclusions are expected in several weeks.

In the meantime, Teleram has installed the metal shields at *Newsday* free of charge and is offering the shields to other 2277 owners for \$40 per unit.

Two Units Faulty

The radiation readings were found during a twice-yearly test of the equipment required under *Newsday* contracts. Results showed readings of 15 mW of radiation per square centimeter over a two-inch area on the top of two units, according to Harry Beery, the newspaper's senior editor for technology. That is 5 mW above the Occupational Safety and Health Administration's (Osha) safety standards.

The high radiation readings were found only at the top of the screens. The emissions apparently posed no harm to the individual machine operators since the radiation dissipated rap-

idly two to five inches from its source, Beery said. But an Osha regulation requires that other workers in the area besides the operators be protected.

Possible hazards could have been faced by individuals leaning over or touching the top of the unit for more than six minutes at a time, according to Bruce Adomeit, spokesman for the Teleram Users Group and *Minneapolis Star and Tribune* technical coordinator. The Newspaper Guild has warned members against leaning or touching the tops of any 2277s which do not have metal shields.

Tests at Issue

Although concern over health hazards — particularly radiation dangers — associated with CRT usage have been growing (CW, Feb. 25), the *Newsday* incident is one of the few known cases where emissions have measurably exceeded government safety standards. Many critics, however, claim that the standards themselves are questionable.

As if in proof of that claim, Osha is currently considering lowering the standards for RF microwaves — the type emanating from the 2277s — from 10 mW to only 1 mW per square centimeter. The drastic reduction proposed reportedly resulted from new research and biological evidence.

Adomeit of the Teleram Users Group claimed that tests being conducted for radiation are not necessarily valid; Osha regulations require two different kinds of probe measurements, and only one is normally taken, he charged.

But Adomeit admitted that even if the units are not completely in compliance with Osha standards, there is no "immediate danger to the health of employees."

IRCs File Tariffs to Open More Telex Gateway Cities

CW Washington Bureau

WASHINGTON, D.C. — New International telex tariffs were filed by the four major international record carriers (IRC) earlier this month. If accepted by the Federal Communications Commission (FCC) the tariffs will become effective in July.

Chief beneficiaries will be international telex users in 21 U.S. cities that now lease private lines between their premises and IRC switching centers in

five "gateways" — New York, Washington, Miami, New Orleans and San Francisco. Under the proposed tariffs, these customers will be able to interconnect locally with international carrier facilities, eliminating the leased-line charges.

The 21 cities include Atlanta, Baltimore, Boston, Chicago, Cleveland, Dallas, Denver, Detroit, Houston, Los Angeles, Milwaukee, Philadelphia, Pittsburgh and St. Louis.

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IN DEPTH

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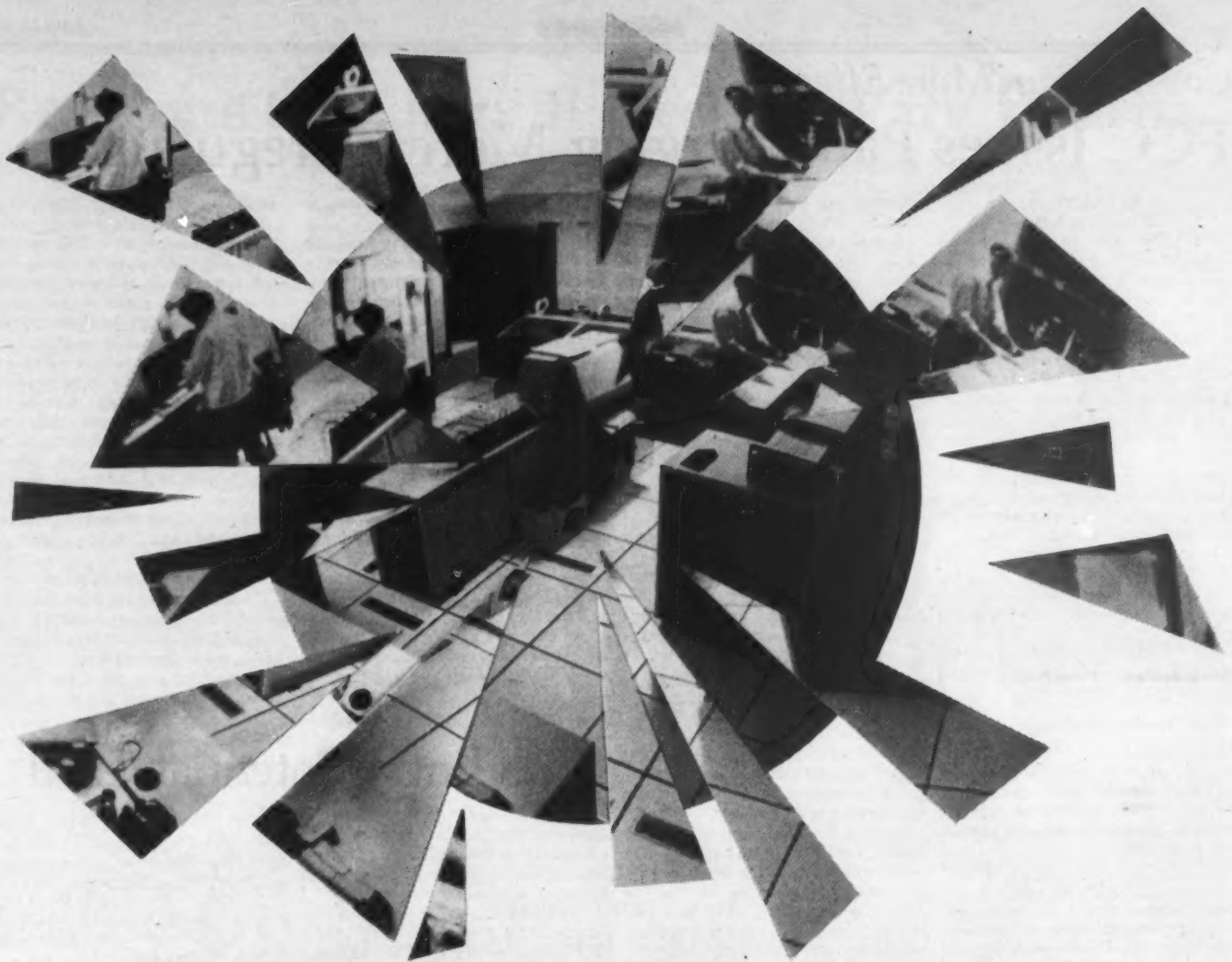
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Competition 'More Effective'

FCC Issues Paper Urging More Deregulation

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — Although Congress and the Federal Communications Commission (FCC) have decided that the telecommunications industry should be deregulated, there is still opposition to the idea — notably from some rural telephone companies and consumer advocates who feel their customers and constituents will suffer.

This month, in a lengthy "working paper" published by the FCC, three economists addressed these concerns. Their basic conclusion: Competition is a far more effective method than regulation for promoting the social goals of the Communications Act of 1934.

The working paper is entitled "Social Objectives and Competition in Common Carrier Communications: Incompatible or Inseparable?" The authors and Nina W. Cornell and Daniel W. Kelley of the FCC and Peter W. Greenhalgh of the Justice Department's Antitrust Division.

'Reasonable Charges'

One goal of the 1934 act, they pointed out, is to promote universal telephone service at "reasonable charges." Present regulatory policy attempts to do this by allowing higher cost rural telephone services to be partly subsidized by revenues earned from lower cost urban services.

It is assumed that if the rural-area costs are reduced, they will attract more customers. But the working paper argued that this policy has failed — partly because the subsidy applies only to long-distance rates, and thus affects only some rural customers.

Mainly, however, the failure is attributable to the widespread use of flat-rate pricing, which combines the charge for a telephone connection with the charge for a specified amount of usage. This arrangement means that "low frequency users face a charge that is more than proportionate to the

relative costs they impose on the system," the study said.

A much better way of achieving the 1934 act's "reasonable charges" goal would be to bill the customer separately for connection and for service, the study added. The rates paid by each user would then more accurately reflect the actual usage of the telephone network.

Local Service Deregulation

Local exchange telephone service should also be deregulated, the authors argued, because this would lead to introduction of new, competing technologies offering lower rates.

They pointed out that although "conventional wisdom" holds that local telephone service is a natural monopoly, Xerox Corp. already has requested the FCC to allocate the spectrum for a new local distribution system, utilizing microwave, that would compete with telephone company-provided local loops.

Several other alternatives were mentioned. One of the most interesting is a new 800 MHz citizens band radio service. The study calls it "the equivalent of a telephone system with the switching capacity in the handset."

Many of these techniques have been known for some time, but have not been implemented because of regulatory policy, the study argued. Specifically, the assumption that local exchange telephone service is a natural monopoly, by eliminating competition, has also eliminated the incentive for "the local exchange monopolist" to deploy new technologies.

Possible Problems

Although relying on competition will produce a number of benefits, it also poses some problems, the authors admitted.

For example, a local exchange monopolist is in a position to deny interconnection to competitors needing

those local distribution facilities to reach their customers.

However, the study contended this problem has largely been eliminated — partly because of the equipment registration program established by the FCC in the wake of its 1968 Carterfone Decision, and partly because of the negotiations — under way for some time between specialized and telephone carriers — regarding interconnection of their competing telecommunication services.

'Separation' Issue

If the telephone company's power to prevent physical interconnection with competing suppliers has been largely eliminated, its power to charge discriminatory prices remains, the study said, adding that accounting controls will not provide sufficient protection.

"As long as a firm is fully integrated," the authors pointed out, "no regulatory agency is able to determine what price it is paying for interconnection" of its long-distance services and

facilities to its local exchange system.

Perhaps the most significant conclusion of the study is its statement that "a cost-benefit analysis, taking long-run dynamic effects into account, may show that the benefits of having many suppliers outweigh the short-run costs of lost economies of integration."

It is generally agreed that some competition exists in the telecommunications industry today, the authors pointed out. "Less well understood, perhaps, are the gathering signs that innovation, begun in the interexchange [intercity] portion of the market, may now be coming to local loop services." Most of this emerging innovation, they added, is being generated by "potential entrants" such as Xerox and Satellite Business Systems.

The basic reason for what the study called "the demise of monopoly control" is its "failure to serve society's basic goal of the best service at lowest costs over the long run. That goal requires elimination of barriers to innovation."

Data Entry Potential Cited

(Continued from Page 1)

that mailing, Impact Marketing received 110 usable replies to 20 questions related to data entry, the firm's president, Charles W. Newton, said.

Asked which data entry method offers the most potential through 1983, 68.8% of polled DPers said key-to-disk was the clear choice. Fifty-six percent said distributed on-line terminals are the best choice, and 41.3% said centralized, dedicated on-line terminals best suit future data entry needs.

Optical character recognition and page document readers came in a distant fourth in the poll, with 15.6% of polled users citing that as the data entry method with the most potential, according to the survey.

Card punching devices and portable

dial-up terminals tied for fifth place, with 9.2% of polled users selecting those methods.

Point-of-sale terminals registered sixth with 7.3%. Touch-Tone telephones followed with 6.4%, and handheld data recorders culled 5.5% of the vote, the survey reported.

DPers apparently do not have much hope of seeing usable voice data entry machines before 1983. Only 2.8% of the polled users cited that method as having potential. Optical mark readers also received 2.8%.

IBM is the clear favorite to introduce new technology to the data entry field, according to Impact Marketing.

Asked how they felt about nonmainframe vendors supplying data entry equipment, an overwhelming 84% chose the response "We simply accept data entry equipment on its ability to meet our specific data entry needs."

From a field of 16 data entry vendors, IBM held a commanding lead over its competition, with 24.5% of polled DPers choosing it as the most influential data entry vendor.

Nixdorf Computer Corp. came in a strong second with 18.1% followed by Computer Machinery Corp./Pertec Computer Corp. and Infocore, Inc. with 10.6% each.

Four Phase Systems, Inc. came in fourth with 8.5%, followed by Univac with 6.4%, the survey said.

Rounding out the top 10 data entry vendors were Mohawk Data Sciences Corp. (5.3%), Consolidated Computer, Inc. (CCI) (4.3%), Data 100 Corp. (3.2%) and Digital Equipment Corp. (2.1%).

The Impact Marketing report, however, points out that CCI was inadvertently left out of its questionnaire. Without mention, the company came in eighth in the vendor ranking.

Control Data Corp., Datapoint Corp., General Electric Co., Honeywell, Inc., Recognition Equipment, Inc. and Sycon, Inc. all tied for last in the survey. Each of those companies received 1.1% of the vote by polled user.

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Reactions to Inquiry II Decision Vary Widely

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — Several industry groups and congressmen last week reacted to the Federal Communications Commission's (FCC) decision in the Second Computer Inquiry with widely varying viewpoints.

The Computer & Communications Industry Association (CCIA) lashed out at Rep. Lionel Van Deerlin for his approval of the FCC's final decision in the Inquiry [CW, April 14]. Shortly after the commission's decision was announced, the California Democrat said it "might be the most significant" FCC policy statement in a dozen years. He suggested the House of Representatives "consider scaling back its own legislative efforts" — a reference to H.R. 6121, the rewrite of the Communications Act of 1934.

That bill is currently becalmed in a sea of controversy within Van Deerlin's House Communications Subcommittee. The congressman's basic point was that the FCC decision addresses some of the major controversies blocking the bill's passage, so it may be possible to simplify the bill and make it more acceptable.

In a letter to Van Deerlin last week, CCIA President A.G.W. Biddle tried to shoot down the congressman's trial balloon. Calling the FCC decision "bad public policy," Biddle said "we strongly oppose the congressional ratification of this decision through either action or inaction of your subcommittee."

Alleging that the FCC's decision "attempts to circumvent the 1956 AT&T Consent Decree, despite the commission's lack of power [to do so], and permits AT&T to enter the unregulated data processing marketplace," Biddle said the FCC decision also does "virtually nothing to prevent anti-competitive cross-subsidies within AT&T manufacturing or research and development organizations or between these organizations and the monopoly companies of the Bell System which provide regulated telecommunications service."

Blast From IDCMA

Another comment on the FCC decision came from the Independent Data Communications Manufacturers Association (IDCMA), which represents the nation's independent modem manufacturers.

"There are ever-increasing indications that the commission has failed to adequately address the problems of Western Electric [Co.] and Bell Laboratories," the group said. "Without adequate separation of these components of the Bell System, there can be no meaningful separation and no fair competition."

"If IDCMA's perception is corroborated [in the final text of the Computer Inquiry II decision, which is still being written], it will file a petition for reconsideration and consider other remedies. Consent Decree relief seems especially improper without adequate safeguards."

Cbema Hopeful

The Computer and Business Equipment Manufacturers Association (Cbema) was considerably more hopeful: "The [decision] by the FCC ap-

pears to be a positive move embracing positions Cbema has espoused for some time. We note for instance that deregulation of customer premises equipment and all enhanced services will prevail under the order. These are actions we have advocated for several years."

"We are pleased that the FCC has recognized the need for safeguards to prevent cross-subsidization on the part of AT&T. We look forward to studying the text of the order to determine whether these safeguards are sufficient to achieve this objective."

Another comment on the cross-subsidy question — possibly the most significant one of all — came from Rep. Tim Wirth (D-Colo.), an influential member of Van Deerlin's subcommit-

tee. Wirth issued a statement supporting changes in the text of H.R. 6121 recently developed by Alfred Kahn and Henry Geller.

Kahn is chairman of the Council on Wage and Price Stability and former head of the New York Public Service Commission. Geller is the President's chief telecommunications advisor.

Wirth's Statement

Wirth has opposed previous drafts of H.R. 6121, alleging they failed to provide adequate separation between the "monopoly" and "competitive" activities of Western Electric and Bell Labs, thereby making it possible for the deregulated subsidiaries established by the pending bill to be unfairly cross-subsidized by revenues earned from

AT&T's monopoly operations.

In his latest statement, however, Wirth said the Kahn-Geller amendment "provides significant protections against cross-subsidies, drawing a line between monopoly and competitive activities, and applying arm's-length and information requirements on conduct of product and service-related business across that line. The amendment limits the scope of these arm's-length and information flow rules to less than the protections previously agreed to, but... I am willing to support this compromise so we can get H.R. 6121 back on the track."

"I believe it is imperative that Congress set communications policy, and H.R. 6121 does just that," Wirth stated.

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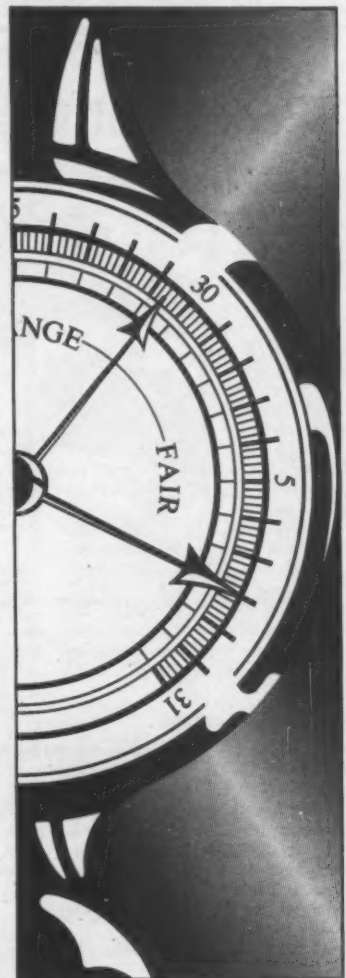
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Contract Programmers Finding Work Plentiful

By Bruce Hoard
CW Staff

There is no shortage of work for contract programmers.

Four out of seven contract programming houses surveyed last week said they had all the business they could handle. Two others are tightening their belts, but not cutting staff. Only one reported difficulties.

Grove Lewis Associates (GLA) in Glenview, Ill. is "getting much more business because the economic conditions make people want to automate, so they seek consulting," according to GLA DP consultant Larry Dimond.

GLA has been growing so rapidly that it has developed some cash flow problems, forcing it to level off growth and concentrate on short-term jobs. However, that leveling-off process has not affected the hiring process, Dimond noted. The company hired more people in the first quarter of 1980 than in any quarter last year.

GLA presently has a full-time staff of 30 to 40 programmers and employs approximately 20 independent programmers in various contract jobs each month.

The firm's recent move from two buildings into one larger structure could be construed as a cost-cutting move, but is not part of a larger program to put back services or personnel, Dimond said.

View From Dallas

System Programming Resources, Inc.'s (SPR) Dallas branch office is another contract programming house riding an economic crest, according to Technical Manager Jim Anderson.

"We've been affected by the bad economy, but in a positive way," he said. "Our business is improving so dramatically, we can't find enough people." Right now there are 30 immediate openings for programmers.

As was the case with five of the other

six firms, SPR has not cut back in other areas in order to maintain programming personnel, and Anderson said his company had just hired a new salesperson.

SPR has eight nationwide branches with five more scheduled to open this year.

Boston's Scene

Keane Associates of Boston employs 400 contract programmers full-time and "we're trying to hire as many more as we can," Director of Development Programs Jerry Erwin said. He expects 150 more to be added this year.

Keane is "conservative" with spending, but not actively working to reduce costs. The company has felt only "a very slight impact" from the inflationary spiral, Erwin said.

Asked to give his opinion on how programmers can best avoid being trapped in a recessionary void, he suggested they join a consulting firm such

as his and then float from job to job without having to worry about changing employers.

More From Illinois

On the other hand, Consumer Systems Corp. of Oakbrook, Ill. has slashed its hiring rate 20% this year as a hedge against the deteriorating economy. According to Michael Jakaitis, manager of recruiting for that company, "We're being more discriminate in our hiring practices now."

He made it clear that the firm is "tightening its belt but not cutting staff" and said travel costs are being reduced for "frivolous" concerns such as seminars and conventions. Such savings could add up to as much as 5% of gross revenues, he estimated. The company employs about 130 contract programmers.

Jakaitis concurred with five other respondents who said the current inflation and recession pressures are less threatening than those of the recession of 1973-74.

Southgate, Mich.

One person who said he is being strongly affected by the country's economic woes is Paul Showalter, vice-president of Programming Services, Inc. (PSI) in Southgate, Mich. PSI is a five-man crew consisting of two attorneys, a certified public accountant and two programmers.

Besides doing contract programming, the firm also handles computer contract negotiations. Both aspects of its operation have been restricted by the economy, and Showalter cited Detroit's economic malaise as a contributing factor.

"We're caught in a 'Catch-22'. We need money to put up front for projects, but it's too tight to get it right now," he said.

Despite painting a grim picture — which included reduced salaries and less advertising — Showalter was optimistic about his company's growth potential and looks forward to adding more full-time programmers.

Recent layoffs of both blue- and white-collar employees at nearby auto plants have reduced Detroit to an economic shambles, he said, adding, "When the auto industry rolls over, everybody gets crushed around here."

DPers Weathering Economic Storms Well

(Continued from Page 1)

W. Labovitz, DP director.

However, the impact has been nowhere as severe as on his DP operation. Nonetheless, Labovitz said he decided not to hire a new systems programmer allowed in his budget.

A Morgantown, W.Va., bank increased its DP staff from six programmer/analysts to eight during the first quarter, anticipating an upgrade to an IBM 4331. However, the firm's DP manager said economic conditions forced the shop to cut a third new programmer/analyst slot.

To take up the slack, the firm will use more outside consultants to assist with the conversion.

For a Washington, D.C.-based educational and scientific institution, the economic situation has proved a hardship. Because it is funded by the federal government, it must comply with President Carter's "two-for-one-hiring freeze." This means two employees must leave before a new employee can be hired.

Contract Labor

Although most firms are going ahead with staffing plans, many are using contract labor as a cushion to protect in-house DP jobs.

Typical of these is American Hoechst Corp., which needs 16 new DP personnel this year. Instead of hiring all 16 as additions to its in-house staff of 95, the firm decided to fill only eight positions in-house.

The company will also hire eight outside consultants, according to Karlis V. Rutins, vice-president of information systems for the U.S. subsidiary of this German-based plastics and pharmaceuticals firm.

Figuring consultants fees at \$50,000 per year, Rutins noted his firm could eliminate \$40,000 from its budget immediately without firing anyone. "In Europe we take a long-term approach to hiring and firing," he said. His firm is feeling the impact of a recession in the slackened demand for its petrochemical-based products.

At the Stop & Shop Companies, a Boston-headquartered supermarket chain, 8% of its 60-person DP staff needs are being filled by outside con-

sultants, according to James Kisthardt, vice-president of information systems. He said this tack was taken in light of current economic conditions.

These conditions forced one Midwest

This survey was prepared and written by CW staffers Marcia Blumenenthal, Tom Henkel and Marcy Rosenberg.

manufacturer of coin-operated machines to turn to outside consultants not for special projects but, for the first time, to do coding and upgrading of documentation.

Hardware Outlays

Aside from using consultants as a hedge against economic uncertainty, 25% of the DP executives said they were reconsidering plans for hardware outlays or stretching out the procurement of equipment to control costs.

Soaring interest rates prompted two users to scrap plans to buy 3033 or 4331 CPUs. Both of those users said they will continue to lease their processors.

For one user, however, it seems like the right time to buy — but on a more modest scale. A California department store chain decided to get rid of its rented IBM 3031 in favor of buying a 370/168.

Peripherals Delayed

Two other firms surveyed planned to hold down expenses by delaying peripheral equipment procurements. One, a furniture manufacturer in Michigan, will put off acquiring additional disk drives.

"If times were good, we would get the equipment now to save a little bit of hassle. Instead, we intend to buy it only when we need more capacity, perhaps three or four months from now," according to the firm's manager of systems and DP, who asked not to be named.

Adopting a similar strategy was an Illinois-based company that stores and distributes service parts for construction machinery. This user, which has 30 DP staffers, plans to hold off up-

grading its tape drives to a faster speed until next year.

Job-Hopping

Despite a gloomy economic outlook, are DPers continuing to job-hop? While most users said there has been no change in turnover rates, 29% disagreed, citing economic conditions as the reason for decreased turnover.

"There was a fierce turnover rate last year because of the President's wage and price guidelines," a spokesman for Pneumo Corp. noted. "However, the turnover rate has slowed down for the past two months."

American Hoechst's Rutins has seen the same trend at his company since the beginning of the year.

"This currently is a bad time to job-hop," according to Fred Schomer, DP manager for Arvey Corp. in Pittsburgh, Pa., a paper products manufacturer and retailer whose programmer/analyst and operations staff numbers 14.

"The people who are job-hopping are the ones commanding higher salaries, and, in a recession, they will be the first ones out of work. When you start trimming, you start trimming fat."

Recession to Spare DP?

(Continued from Page 1)

expects the job market to constrict from a little to a lot, depending on how the recession develops.

Subtle Indicators

For the average systems programmer or analyst, the indicators of hard times could be subtle. A tightened DP budget will probably be the first tell-tale sign, Crotty suggested.

That could be followed by internal project cuts, possibly accompanied by a hiring freeze.

A layoff of marginal programmers will be a not-so-subtle indicator of economic troubles and could precede more significant layoffs, Crotty warned.

A DP'er should also keep an eye on how his employer is paying for its systems, he said. Killing plans to buy a CPU or peripherals in favor of contin-

ued leasing could be a sign of trouble.

However, Crotty cautioned that indicator could be a result of other factors — management may expect further price cuts on a given CPU or peripheral or may expect new models to be introduced.

DPers should also keep an eye on the OEM market, he recommended. The Gartner Group expects that market to be one of the first hit by a recession.

Falling OEM orders is one of the first signs that the recession is significantly hitting the DP business. Slipping OEM orders could portend serious and possibly fatal consequences for OEM vendors.

If the recession gets worse, that trend could drift over to mainframers and peripheral vendors, Crotty predicted. Minicomputer vendors seem to be stronger in the market than larger mainframers, however.

System/38 Software Snagged By Memory Requirements

(Continued from Page 1)

disk storage.

Like the Display Information Facility, this package now requires 256K more bytes of main memory and an extra 64.5M bytes of disk storage. Other minimum requirements of one line printer and 5251 Model 11 Display Station are unchanged.

System/38 Retail Data Preparation package has been delayed from February 1980 delivery to May 1981. In addition, the package now requires 129M bytes of disk storage, double the original specifications.

In addition, support for one 5251 Model 11 or 12 display station has been eliminated from the minimum configuration. Like other packages, Retail Data Preparation now requires a Model 322 processor as opposed to a Model 321. The only unchanged minimum configuration element is the main memory requirement of 512K bytes, IBM said.

Mapics and DMS/38

Two other major program products, Manufacturing Accounting and Production Information Control System (Mapics) and the Distribution Management System (DMS/38) Financial Applications packages, also carry the 256K main memory increase and doubled disk storage requirements.

Moreover, those packages now use internally described data for program file access as opposed to externally defined data, originally offered with the packages.

IBM said data is now defined internally to make it easier for users of those same packages in RPG-II to convert to RPG-III. IBM also claimed the changes will make end-user training easier. Programs included in Mapics and DMS/38 Financial Applications, 14 in all, were delayed one year from the originally promised dates [CW, April 14].

In addition to revamping some packages, IBM is taking an extra look at some others. Communication Control Program (CCP) Execution Subroutines, designed to aid in utilities conversion, have been scrapped. Now those programs are not needed, IBM said, and the firm has taken them off the market.

System/38's Control Program Facility (CPF), which was originally slated for release in August 1979, will now be available in July 1980, the same time the first end-user model of System/38 appears.

CPF has been enhanced to support IBM 3411/10 magnetic tape units for user library backups. Users can now optionally use 3411 or 3410 tape drives. In addition, the CPF copy facility has been enhanced to support the 3411/10 for input only. System/38's RPG III, however, supports the 3411/10 for both input and output of data files, IBM said.

Conversion From System/3

Users planning to convert to System/38 from IBM's System/3 may have to find a larger System/3 Model 15 before converting to System/38. To use IBM's System/38 System/3 Batch Conversion Utilities, IBM said "the batch conversion utilities will generally run faster on the System/3 Model

15 than on other System/3 models.

"Users with limited machine time available may wish to make arrangements for their conversion to be run on a System/3 Model 15," IBM said.

In addition, the minimum disk capacity for some minimum configuration System/3 models has been changed to accommodate the System/38 System/3 conversion utilities. IBM said all the changes and enhancements to its program products were to aid users. A spokesman denied accusations that there were problems with System/38's data base.

The enhancements to System/38 software were announced to users in December, a spokesman added.

CDC Hikes Prices

MINNEAPOLIS — Control Data Corp. has raised lease prices 10% for its Cyber series mainframes and 7% for IBM plug-compatible peripherals. The firm also hiked purchase and lease prices for software products 10%.

On Cyber series peripherals, lease prices for disk and tape controllers rose 9.5% and lease and purchase prices for tape transports increased 10%. The company made no purchase or lease price increases for either disk drives or printers.

The increases are effective May 1 or as soon as a user's current contract permits, the firm said.

In other price adjustments, CDC hiked its maintenance fees 6.7% and increased professional consulting

services 12%.

At the Service Bureau Co., prices of selected applications rose an average 6.5%.

But some product prices will be cut. CDC reduced by 7.5% the cost of its Plato educational terminals and slashed the purchase price of memory products up to 31%.

Inflation Cited

Aside from citing inflation as the reason for the price increases, CDC also attributed the increases to rising interest expenses and the cost of precious metals.

The vendor noted its average price increase was 4%, in keeping with President Carter's wage and price guidelines.

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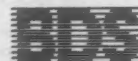
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CW 4/28/80

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DPers Suspected for Fixing Traffic Tickets

By Bruce Hoard
CW Staff

SYRACUSE, N.Y. — Between six and 10 DP employees are under investigation here in an apparent ticket-fixing scheme involving as many as 732 traffic violations.

Eighty of the tickets were accumulated by one of the DPers at the center while 45 and 25 were amassed by two others, respectively, according to Syracuse City Auditor Roy Bernardi. Bernardi put the total value of all 732 tickets at approximately \$8,000.

The tickets were discovered missing from a computer log here recently during a routine audit of the city's traffic violation bureau, Bernardi said.

Bernardi refused to disclose names, saying only that the individuals have worked at the center for periods ranging from one to four years. None have been suspended.

Moreover, several former employees are also suspected of complicity in the operation because some of their tickets were also voided, he added.

At the time of the audit, 50 to 100

tickets were randomly taken from about 60,000 records maintained by the bureau and compared with duplicates from files at the DP center.

Bernardi noticed that one of the duplicates had been voided with a code different from the one normally used to indicate payment. Suspicious of the deviation, the auditor searched the system for other tickets cleared with the same code and came up with 170, a number that has subsequently more than tripled.

"They didn't put it in the amount re-

ceived for the fine because it wouldn't have jibed with the amount of dollar income actually taken in," Bernardi said. The code they used was a string of zeros after "date paid" and "amount of fine."

Anyone familiar with the computer system here realizes that an audit could turn up their altered records, the auditor said, adding whoever did it evidently felt confident in the odds against that happening.

Larger Problem

Bernardi thinks the ticket scam may be only a small part of a larger computer crime scene, and his requests for outside computer security experts who could "secure" the system have been relayed to Syracuse Mayor Lee Alexander and Onondaga County Chief Executive John Mulroy.

"I don't believe we can use people we have in-house to take a look at the entire operation and make sure there are no abuses anywhere else," Bernardi said.

The system is the heart of a city-county financial system that also keeps track of payroll, water bills, vendor invoices and police and sheriff department records.

Terrorists Burn Two French DP Centers

(Continued from Page 1)

present and future dangers of computer systems.

"Computers are the favorite instrument of the powerful. They are used to classify, to control and to repress. We do not want to be shut up in the ghettos of programs and organizational patterns," Clodo said.

The fact that the attackers hit computer centers run by European companies rather than U.S. multinationals such as IBM or Univac seems to fit with a newly perceived trend: computer technology is gaining a European identity. This is particularly true now that pressure is being exerted on government organizations to buy European-made DP products.

Many observers here believe these attacks are a bellwether of worse to come.

If the security authorities are right in their claims that the terrorist groups of Europe have become linked — that Italians and Germans are involved in French terrorism, and vice versa — it may well be that the attacks will spread beyond France.

The statements to the press by the Action Group were full of the spirit of brotherly fighting one might expect when two groups are claiming separate responsibility for an action. The Action Group indicated that in the future

it would leave proof of identity behind: The letters OAD would be written on the floor.

Societal Issues

It is often forgotten that the debate about the social consequences of computing technology was initially an American phenomenon. The debate began in the early 1950s, with the publication of Norbert Wiener's *Cybernetics*, and reached its peak under President Johnson. In the mid- to late 1960s, the computer industry was almost entirely American.

What was not noticed in America was that those arguments passed Europe by. But things have changed. The debate on the future of society in what is rapidly becoming known as the era of "The New Technology" is a European, not an American, pursuit.

Hardly a week goes by without a research document or a trade union statement from some European source on the subject.

At its upcoming annual meeting, The Society of Civil and Public Servants in the UK, the union that represents most of the higher level civil servants, will consider a recommendation to resist new technology proposed by the government. The reason: union members believe the government is seeking to reduce civil service employment

through automation.

At least four experimental computer projects are likely to be threatened, and all four are capable of widespread expansion. They are a word processing experiment which showed productivity increases of between 10% and 70%, an experiment in data transmission to speed up the social security system, a project in matching the unemployed to existing vacancies using a computer system and the replacement of manual clerical labor in land registration and the transfer of titles.

Managers Get Job Warning

(Continued from Page 1)

ing thrust into top general management positions.

But in the upper echelons of the corporate hierarchy, success as a manager usually depends less on technical expertise than on a good head for business. To succeed in their chosen field, therefore, DP managers will have to learn to think and behave increasingly as business persons, Blozis said at NCR's 10th annual users group meeting.

DP managers who neglect to cultivate a strong business sense and who insist on remaining pure technicians run the risk of becoming professionally obso-

lete within five years, he warned.

Speaking on the subject of information systems management, Blozis advised DP managers to run their shops as if they were independent companies, not merely as departments within larger organizations. Computing room heads, he said, should set specific administrative goals for their "companies" and then map out a strategy for achieving those goals.

Like many other "top corporate executives," DP managers should establish procedures for DP monitoring and improving the efficiency of their internal operations, Blozis advised. In particular, they should seek to find out:

- How often their departments meet their reporting deadlines.
- How their current supplies expenditures compare to last year's.
- The percentage of the total computing resources for which each user department accounts.

Blozis also urged DP managers to develop a formal plan for improving staff productivity and to require periodic (preferably monthly) reports detailing all data center problems and outlining a course of action for each.

In dealing with users, DP managers should draft a formal contract for each application development project and then charge fees for the use of their systems and programming resources, Blozis recommended. The user-DP department contract should explain each project's expected benefits, set forth user specifications, list the products to be delivered and establish a specific time table for the completion of each project phase.

In dealing with upper management, meanwhile, DP managers should make sure their formal proposals for new systems include a one-page executive summary highlighting their system's key points, Blozis suggested. Their proposals should also include a financial analysis and candidly admit each system's potential risks.

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And Faster, Too

DPer Claims Manual Sysgen More Economical

By Tom Henkel

CW Staff

EDMON, Okla. — While some DPer's feel it is unwise to attempt a 4331 system generation (Sysgen) without IBM's Installation Productivity Option/Extended (IPO/E), one DPer here claimed a non-IPO/E Sysgen is actually faster and more economical.

Maithreyi Manoharan, assistant director of the computer center at Central State University, said a manual 4331 Sysgen took her about four hours compared with user reports of about eight hours with IPO/E. In addition, eliminating IPO/E can save the equivalent of two 3310 disk drives, according to Manoharan.

IBM's IPO/E has been a controversial subject among users. Some have said the procedure takes up too much disk storage and can potentially cause more problems than it solves. Others, however, have said IPO/E is a handy way of doing a Sysgen and those who criticize it are living in the past by sticking with manual methods [CW, Feb. 4].

Central State came to do a manual Sysgen somewhat by accident, according to Manoharan. The school originally planned to install its 4331 in October 1980. However, it was able to get the CPU a year earlier. The problem came when the 3310 disk drives ordered with 4431 were not delivered.

IBM is not delivering the 3310s "for a long time," Manoharan said. "IBM is giving us a delivery date of June 1982."

IBM said it is delivering 3310 drives on time, but the firm would not comment on individual cases.

With 3310 drives still on order, Central State decided to go ahead and use its system with Telex Computer Products, Inc. 5312 disk drives, IBM-compatible units left over from a 360/40. Since these drives are too small to handle an IPO/E Sysgen, the university was forced to do it manually, Manoharan said.

Individual Tapes

"When I ordered my system I said I do not want IPO/E; I want the individual components, and I named the components I needed (including DOS/VSE, VSE-Power, and VSE/Advanced Functions). The [IBM] marketing representative took it from there and ordered them. Each tape came with its own instructions. So [IBM] is prepared to give [individual tapes] to you if you ask for them."

If you don't specify individual tapes, "IBM will probably send the IPO tape. From that it is difficult to [manually] generate a system," Manoharan said.

To generate the 4331, Central State used a 370/138 which the school uses for administrative processing. The 4331 is set aside for educational use.

Since the 370/138's 3330 disk drives could accommodate a full system resident (Sysres) file for individual software components, the school decided to do the Sysgen on that system.

Sysgen Procedure

"The first thing I did was use the stand-alone DOS/VSE tape and dump it on disk. Then I took the advanced functions and put it on top of [DOS/VSE]. Then I took VSE/Power and

added that to it. And I brought up my supervisor.

"I used IBM's examples to generate the supervisor [because IBM provides an example for a 370 mode]. The instructions are clear" on all the individual packages, she said.

"We also had about seven different compilers to go on. I put all the relocatable compilers in a private relocatable library. Most [of the compilers] are IBM, but we did have Watt-V and PLC. [On those compilers] we called the University of Waterloo and Cornell University, [the respective sources for those compilers].

"They said they were originally done under DOS/VSE and they would not

guarantee they would run under VSE. I took their tapes and put them into the relocatable library, and we haven't had any problems," Manoharan said.

Potential Problems

The DOS/VSE-oriented compilers probably work under VSE because Central State uses 5314 disk drives on its 4331 system. When the school receives 3310 drives there may be problems with both compilers, Manoharan admitted.

Once generated on the 370/138 with 3330 drives, Manoharan was faced with the task of transferring the generated software components to the 4331 and the Telex 5314 drives. To do

this the assistant director of the computer center had to remove some modules in the private relocatable library to make enough room for the entire Sysres file on one 5314 disk pack.

"IBM threatened us, saying it was not responsible if the 4331 didn't work," Manoharan said. Realizing she will have to repeat the manual Sysgen process when the 3310 drives arrive, Manoharan said, "I'm happy to do it all over again. With IPO I don't have control. I have generated so many DOS/VSE systems, this was nothing."

Manoharan added she has never used IBM's IPO/E and cannot make a fair judgment on whether it is worth it for some less experienced users.

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PAGE 0002

FAST ANALYSIS OF TAPE SURFACES DETAIL REPORT -- FATS VER 4.0 Z

MESSAGE	ID	UCB	LABEL	OPTION	PASS	FILE	NO	RECORDS	LOCATION	LENGTH	RETRIES	ACTION
FATS204	TAPE2	281	987654						1807 FT	4 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1807 FT	8 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1808 FT	13 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1808 FT	17 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1809 FT	21 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1809 FT	26 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1809 FT	30 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1809 FT	34 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1809 FT	38 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1809 FT	42 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1809 FT	46 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1809 FT	50 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1809 FT	54 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1809 FT	58 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1809 FT	62 IN	10	PERM DATA CHECK

The length of these bad spots would cause unrecoverable data checks and I/O errors during processing.

-- INNOVATION DATA PROCESSING DATE 78-194
PAGE 0001

FAST ANALYSIS OF TAPE SURFACES DETAIL REPORT -- FATS VER 4.0 Z

MESSAGE	ID	UCB	LABEL	OPTION	PASS	FILE	NO	RECORDS	LOCATION	LENGTH	RETRIES	ACTION
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FATS104	TAPE1	280	123456						1 FT		01	TEMP DATA CHECK
FATS104	TAPE1	280	123456						2 FT		02	TEMP DATA CHECK
FATS104	TAPE1	280	123456						10 FT			TEMP DATA CHECK
FATS204	TAPE1	280	123456						2375 FT	6 IN	10	PERM DATA CHECK
FATS204	TAPE1	280	123456						2375 FT	8 IN	10	PERM DATA CHECK
FATS204	TAPE1	280	123456						2376 FT	13 IN	10	PERM DATA CHECK
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'Foolproof Audit Trails'

CES Tabulates Benefits of DP-Based Voting

By Marguerite Zientara
CW Staff

BERKELEY, Calif. — Computer-based voting systems, rapidly proliferating around the country, are said to be cheaper, more accurate and more convenient than electromechanical devices — and offer foolproof audit trails, besides.

"The big old lever machines are very expensive to buy, they're extremely expensive to store because they require a lot of space, they're expensive to maintain and they're expensive to move out to the precincts because they usually require a moving company to do it," according to an executive at Computer Election Systems, Inc. (CES) here.

With three known competitors — all of which are reportedly "quite small" — CES has grown from a spin-off of IBM in the 1960s to the largest vendor of electronic vote tabulating equipment in the U.S. today.

Currently holding contracts for over 650 localities in 43 states, CES considers itself in the vanguard of political voting methods and attributes such leadership to the auditability — and thus enforced honesty — of its systems.

Philadelphia Tradition

One of the states where CES does not have contracts, however, is Pennsylvania, the scene of last week's major Presidential primary. "The old mechanical machines are well entrenched there," the CES spokesman said.

Also well entrenched — in Philadelphia, at least — is a tradition of voter fraud. "Playing games with voting machines is as much a Philadelphia custom as scrapple," *The Boston Globe* reported last week.

In Philadelphia, "election officials promise more than 60 mechanics in radio-dispatched cars to fix balky machines. The Committee of 70, a civic watchdog group, will have 50 mobile teams to check fraud [in the primary]," the *Globe* continued.

Such massive manpower would be unnecessary in an electronic voting system, according to the CES spokesman. But besides unreliability, "the worst aspect of the mechanical voting devices is that they have no audit trails," he maintained.

"When you go into a voting booth you assume, first, that the registers at the back of the booth have been set to zero before the voting and, second, that the person counting votes at the end of the day doesn't tamper with them and counts them accurately," he added.

Cook County Case

To illustrate the level of honesty said to be made possible through electronic voting devices, the CES spokesman cited the case of Chicago's Cook County. The last major vote fraud reportedly took place there in 1960, when mechanical voting machines were in use.

"In the Nixon-Kennedy Presidential contest, legend has it that the Democrats didn't announce the results in Cook County until the California returns came in," the spokesman explained. "Then they went back and made sure John Kennedy won by

enough.

"There's every reason to believe that Nixon's paranoia — that caused him so much trouble in the White House — goes back to that, and there's every reason to believe that John Kennedy was never elected president of the United States," he ventured.

Such a vote fraud will likely not happen in Cook County again, however, since CES got its contract there in 1976. "People in the election business say, 'By God, if you can run a tight, auditable election in Cook County, you can run one anywhere,'" he noted.

Such "tight, auditable" elections are based on the company's five basic products, which it sells, services and

maintains for "mostly countries and some cities" across the nation.

The products include a punch card-based vote recorder, Documation, Inc. card readers ranging in speed from 200- to 1,000 card/min and three computer models to count the cards.

The smallest counting device is based on an Intel Corp. 8085 microprocessor, the medium-size device has a small Data General Corp. Nova 3 minicomputer in it and the largest device is based on a large Nova 3. CES is converting to a Nova 4-based system from the Nova 3, the spokesman explained.

CES' Nova 3s range in size from 8K to 64K bytes of memory and can be used within both "very small and very

large jurisdictions," the spokesman noted.

In the case of the larger Nova 3s, "really all they are is an editing and control device," the spokesman said. "They read the cards in through a Documation card reader, put the cards onto tape and then we take those tapes to a mainframe computer and use our own software program to count them on a mainframe."

The counting program, written in Cobol and originally designed to run on IBM equipment, has been adapted to run on equipment from "every mainframe manufacturer," including Control Data Corp., Univac Corp.,

(Continued on Page 11)



Election Night Snafu May Ignite Lawsuit

By Bruce Hoard
CW Staff

PALM BEACH, Fla. — The county government here is considering a lawsuit against Computer Election Systems, Inc. (CES), whose system broke down here the night of the March 11 Presidential primaries, delaying election results 24 hours.

If filed, the suit would be based on the grounds that CES failed to supply proper technical support and quality control for the system, known as Alpha Ballot Tab.

The breakdown was the second in two years for the system. The previous failure came on election night, 1978, under conditions similar to those of March 11. On both occasions, the system crashed when its minicomputers

went down.

Alpha Ballot Tab uses three Data General Corp. Nova II minicomputers with 16K bytes of main memory, a Documentation, Inc. 100 card/min card



reader and a Tally Corp. 200 line/min reader.

Two of the Nova IIs are supposed to supply tabulations to a third, or master computer, according to Jackie Winchester, election supervisor for Palm

Beach County.

Two of the Nova IIs went down completely during the evening and the third was only partially operable. The CES technician on hand was unable to correct the problems, Winchester said.

CES is not sure what caused the problems. To find out, CES plans to hold a full-scale reenactment of election night activities, including use of the television lights and electric typewriters that were operating March 11.

CES Vice-President Tom Barnes suspects that the power drain and profusion of heat caused by the presence of news media equipment may be responsible for the failure. CES has hired an independent consultant to come in and examine the power supply to the election center.

Barnes maintained that CES upheld its responsibilities regarding proper technical support and quality control for Alpha Ballot Tab. However, he said the county may have failed in its responsibility to provide "clean, uninterrupted power to the system."

CES Praises DP-Based Voting

(Continued from Page 10)

Honeywell, Inc. and Burroughs Corp. "Qualified" by the secretaries of state in all of the states it serves, CES concentrates on selling its products as opposed to leasing because "there's no money in [leasing]," according to the spokesman.

No Value Judgments

Although the firm has an in-house computer of its own, it does not — as might be imagined — get into such things as projections or voting analyses, the spokesman noted. The in-house DG Eclipse instead is used for such administrative tasks as accounts receivable, accounts payable, general ledger and inventory control.

"We wouldn't want to get involved in anything of a value judgement nature and, besides, both of the old New York-based lever machine companies got caught in vote frauds," the spokesman said. "Somebody in each of those companies was 'brought' by somebody in a jurisdiction."

"One thing we would never get involved in is an activity like running forecasts or anything like that," he added. "It's just the antithesis of the business we want to be in."

Enhanced Reliability

The recent Florida vote tabulating snafu notwithstanding (see related story), electronic voting on the whole has increased the reliability of voting systems in terms of accuracy, early returns and audit trails.

And while the reliability of the electronics itself may appear to have improved with time — as witnessed, for example, by CES' handling of 170 elections nationwide in the last two years — that is not the case, according to the spokesman.

CES, for example, has been doing basically the same thing for the past five years, while adding new products and variations of products, he said.

"What really happened years ago was that the competition used unreliable systems, caused vote-counting disasters, and then had to get out of the business," he said.

Another problem in the past, according to the spokesman, was that counties — trying to cut corners — would buy the cards and vote recorders from CES but didn't want to buy a special-purpose computer and software to count the votes. "So they would go to the county's data center and ask some programmer to write a program so they wouldn't have to buy ours."

The result? "There's a county here in California that for 15 years has tried to write its own program and make it work, and they have a disaster every year," he claimed. "They've probably spent \$200,000 trying to write that program instead of paying us \$16,000 to begin with."

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Repair Service 'Outstandingly Responsive'

TI's FS990/10 Performs Well in Benchmarks

By Hillel Segal

Reflecting perhaps the company's strong hardware manufacturing background, Texas Instruments, Inc.'s FS990/10 small computer was rated "excellent" or "good" in most categories of the Association of Computer Users (ACU) benchmarking program.

The FS990/10 was one of the most consistently high-ranked systems in the tests, which compared a dozen

ACU User Comparisons

similar systems in the \$15,000 to \$25,000 price range.

In the tests, all systems ran virtually identical programs in Basic. Some tests, such as the CPU and I/O (floppy disk) tests, checked speed for a specific function. Others simulated a real-life problem using a mix of system resources.

While the benchmark tests graphically demonstrated the differences in computational power, a number of other factors come into play in the selection of a system.

The approach to data processing which the vendor and buyer need to take varies according to the circumstance. Within companies not oriented to computers — those using them for order entry, accounting or inventory, for instance — the right vendor of computing hardware is likely to be one which can invest some time and effort to meet the buyer's DP needs.

For this user, more training, support and documentation oriented to his type of situation are required.

But for sophisticates who simply need a piece of good hardware which

Scorebox			
System: Texas Instruments FS990/10			
Current Price: \$22,105			
Benchmark Results			
		Time	Ranking*
C-1	Scientific/-Engineering Problem	**	**
C-3	Accounts Receivable	3 Min 18 Sec	2nd
Other Benchmark Ranks*			
		C-1	C-3
IBM 5110		8th	4th
Wang 2200VP		1st	3rd
Texas Instruments FS 990/10		**	2nd
Hewlett-Packard System 45			
To be covered next week			

*Out of 12 systems tested in this series.

**Could not run because of memory limitations using TI's standard 990 Basic. Using Power Basic (available from TI's Semiconductor Division), C-1 ran in 6 min 31 sec and would rank between 3rd and 4th place if the run were compared with the others.

they can take their own way, there is no need for a hand-holding type of vendor relationship. This group of buyers can interpret the technical docu-

mentation, then use the utility software as a set of building blocks within a unique application. From this different corporate "personality," the buyer

may approach an entirely different type of vendor.

In the case of TI, applications software seems to be the responsibility of

This is the third in a series of articles giving the highlights of benchmark tests conducted on popular small computer systems. The full reports were originally published by the Association of Computer Users, a 4,000-member nonprofit organization.

umentation, then use the utility software as a set of building blocks within a unique application. From this different corporate "personality," the buyer

the user. While TI provides the operating system, utilities and languages (Fortran, Basic and now Pascal), the user must supply the rest.

ACU's impression was that end users who expect a "complete package" approach to the sales and software of a computer system would be better off buying a TI system through an OEM which offers the desired application programming. But "do-it-yourselfers" in the engineering and scientific professions would probably fare adequately by dealing directly with TI. Several commented that the TI hotline gives them access to technical personnel when needed.

TI's field service response was given very high ratings by users surveyed during the benchmark testing. Repair service was considered "outstandingly responsive" by those interviewed, who said the initial response never took more than 24 hours.

Although the FS990 was equipped with the maximum available memory, the Basic interpreter and operating system occupied more than half of it. As a direct result, two of the benchmark test programs had to be modified to use less memory.

But the scientific/engineering problem, which solves a system of linear equations using the Gauss-Jordan method of elimination, could not be fit at all. Finally, TI's Semiconductor Division supplied a different version of Basic to get around this difficulty.

TI also rewrote the program into Fortran IV. The change in language to Fortran made a drastic difference in

runtime, shortening it by a factor of six.

But the fact remains that the original benchmark program simply could not be run on this machine because of memory limitations, so it could not be ranked along with the other machines in this category for the benchmark test.

Indeed, the system's most significant drawback appeared to be its relatively high operating system overhead. Some of the operating system code, however, was apparently spent on a good file-handling structure. The FS990/10 scored especially well in the I/O-intensive test and accounts receivable problem, tests which exercise the computer's ability to access and modify files on disk.

The ACU was a little surprised when its user survey found most applications were being handled by assembly language programming. Querying users with FS990s, the association found many TI systems were in engineering labs where the computer was a development tool. It was being used to design such things as air missile systems, air traffic control devices, flight computers, electronic games and point-of-sale systems.

With this group of users, hardware-oriented options such as the programmable read-only memory (PROM) programmer and the AMPL prototype development system were important, and the options received high ratings from those surveyed.

Many of the FS990 users surveyed were obviously highly skilled and fully conversant with all the technical aspects of the system's operation. They were not uncomfortable with the idea of receiving a new printed circuit module in the mail and plugging it into their computer's chassis themselves. They seemed to appreciate the modular structure of the FS990, which allows for vertical expansion.

The sophistication of the users was such that they could overcome the lack of packaged software. They were content to develop their own.

It seemed the buyers who worked directly with TI, rather than through an OEM, were aware of what they wanted from a small computer and how to get it. TI seems a strong candidate as vendor to that group of buyers — the experienced users who can find their own direction.

About the Author

Hillel Segal is president of the Association of Computer Users (ACU), a nonprofit association with members all over the U.S., Canada and several foreign countries.

One of the association's key activities is the publication of its "Benchmark Reports."

ACU's Series No. 1 reports on systems priced less than \$15,000. Series No. 2 covers the range from \$15,000 to \$25,000, and Series No. 3 tests systems priced between \$25,000 and \$50,000.

Full reports on these benchmark tests are available from ACU. The entire Series No. 2 is available to members for \$150 (annual dues are \$25). More information is available from the association at P.O. Box 9003, Boulder, Colo. 80301.

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GTE Asks Approval of Second Satellite System

By Phil Hirsch

CW Washington Bureau
WASHINGTON, D.C. — General Telephone & Electronics Corp. (GTE) has requested authority to launch another commercial satellite system, a supplement to the one it already operates in partnership with AT&T.

In a lengthy application submitted earlier this month to the Federal Communications Commission, (FCC), the company's GTE Satellite Corp. (Gsat) subsidiary said it would launch two satellites in 1984 "providing public benefits that are not available in any other existing or proposed domestic satellite communications system."

The cost of the proposed Gsat system — which will include two in-orbit satellites and a ground spare, each having 16 transponders with a transmission capacity of 60M bit/sec per transponder — was estimated at \$198 million.

The system will operate in the 12/14 GHz (Ku) frequency band and employ cross-polarization to double the effective capacity of each transponder. Service will be provided to all 50 states, using spot beams directed at Hawaii and Alaska.

According to the application, this will be the only commercial Ku-band satellite communicating with all 50 states. The system reportedly will include several other innovative features.

Like most of the carriers developing satellite communication networks, GTE plans to transmit voice, data, image, facsimile and graphics in digital form. Private companies, government entities and other common carriers — particularly those providing resale and value-added services — were specifically mentioned as prospective users of the system.

Teleconferencing in Color

Color video transmission at speeds as low as 1.5M bit/sec for teleconferencing applications is one of the technical innovations promised by Gsat. "For data and document [facsimile] transmission, Gsat will utilize forward error correction [and achieve] a bit error rate of less than 10^{-5} ," the application added.

A major problem of using the Ku band is that rainfall attenuates the signal strength rapidly. To get around this difficulty, Gsat plans to employ "advanced ... coding schemes ... several forms of delay compensation and data channel extension equip-

ment."

In addition, "interruptions resulting from heavy rains ... will be minimized by the use of 20 watt power amplifiers on board the satellites and shaped antenna beam patterns weighted in favor of [heavy rainfall] areas."

Long-Life Satellites

The satellites in the Gsat system "are designed for a useful life of 10 years." At the end of that time, according to the company, they will retain 80% of their capacity.

"This long life will permit nonrecurring costs to be amortized over a longer period than other proposed Ku-band satellites," resulting in lower annual costs to the user on a per-circuit basis, the company said. These benefits,

however, are dependent on assignment by the FCC of the specific orbital slots requested by Gsat (100 degrees and 103 degrees west longitude).

The Gsat system will employ time-division multiplexing combined with

'Color video transmission ... for teleconferencing applications is one of the technical innovations promised by Gsat.'

demand-assigned multiple-access techniques to allocate bandwidth among users. Besides increasing channel utilization, this scheme will allow capacity to be reallocated dynamically, permitting users to buy only as much

capacity as they actually need, regardless of fluctuations in their requirements.

Gsat said it intends to provide a minimum 10^{-4} bit error rate, without forward error correction, on 99.7% of all bits transmitted.

"The primary mode of the satellite system will be the transmission of high bit rate, 60M bit/sec, quadrature phase shift keyed (QPSK) wideband digital signals," the company explained. "Voice, data, image and message traffic from customers which is not already in digital form will be digitized at the earth station interfaces. The digital voice encoding bit rate will be selected to give voice service comparable in performance with other available private-line voice offerings."

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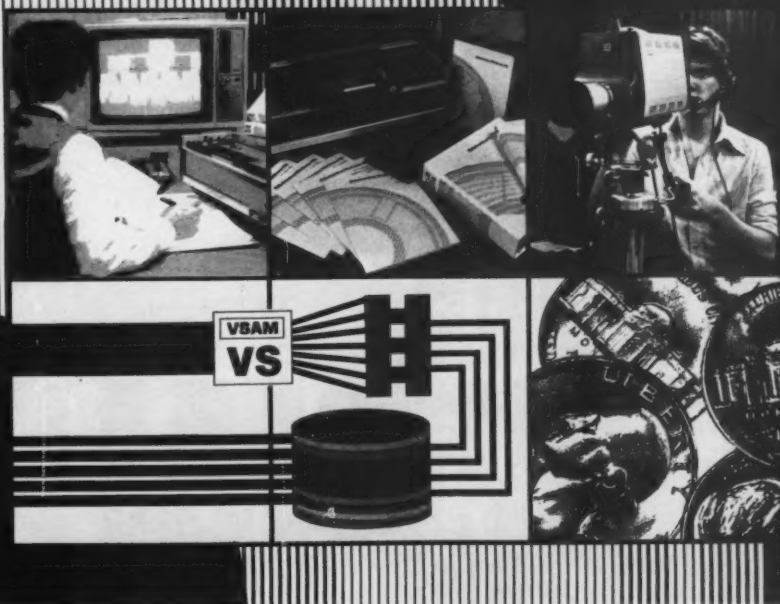
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Frank to Key Fall Comcon

WASHINGTON, D.C. — Dr. Howard Frank, a principal investigator for the original Arpanet design studies, will keynote the Comcon Fall '80 conference, which this year will focus on distributed computing.

Frank is president of Network Analysis Corp. and a member of the White House Advisory Committee on Information Network Structure and Functions.

Sponsored by the IEEE Computer Society, Comcon is slated for Sept. 23-25 here. More information on the conference is available by writing Comcon Fall '80, P.O. Box 639, Silver Spring, Md. 20901.



Dangers of Contract Acceptance Clauses Cited

By a CW Staff Writer

SAN FRANCISCO — Users should carefully word minimum performance specifications clauses in their computer contracts to avoid getting burned if the system later breaks down.

That was a lesson one could learn from a recent court decision reported in "Computer Law and Tax Report" (CLTR), a service to computer users and their advisers. In the decision, a systems house — Automated Health Systems (AHS) — was judged to have met all the specifications set for it by the user and therefore was entitled to payment, even though the system allegedly later failed to work to the user's satisfaction.

AHS had agreed in 1970 to furnish a pair of minicomputers and associated

software for the city of San Francisco's hospital laboratory. Each system was to be paid for after it had successfully passed a 30-day acceptance test.

The first system, based on a Digital Equipment Corp. PDP-12, was installed and passed its test at the required "95% effective" level. The city purchased it without incident. But it was another story for the second system, a DEC PDP-15-based clinical laboratory information system, CLTR reported.

AHS-owned, PDP-15 was to be supplied by AHS along with chemistry and hematology software, while the city supplied other hardware. The system completed its acceptance test in April 1973.

When AHS claimed the test was suc-

cessful and demanded payment for it, the city refused to accept it or make the payment. AHS continued to work on the system while negotiating with the hospital in an attempt to settle their differences.

In November 1973, the successor corporation to the now bankrupt AHS sued the city, according to CLTR.

Terms Met

The court decided in favor of AHS on May 16, 1979. It ruled that the firm had met the terms of the contract on the evidence that — well after the acceptance test was concluded — the hospital had discontinued parallel operation of the chemistry and hematology sections of the system.

This, in the view of the court, proved

that the hospital had confidence in the system, according to CLTR.

The city argued that since the system developed problems at a later date, it was not bound by the acceptance test. On Feb. 6 of this year, the court affirmed on appeal that the satisfactory conclusion of the test gave AHS the right to payment by the city.

The appellate court opinion pointed out that the city was obligated to pay "automatically when a 30-day acceptance test, as contractually defined in elaborate detail, was performed at a level of 95% effectiveness."

It further stated that AHS had taken the risk that the system would not be able to pass the acceptance test, but once that system had passed, the city then bore the risk.

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U.S. Trade Reps Not Ready To Guide Data Flow Policy

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — The office of the U.S. Trade Representative (USTR) is not in a position to assume the lead policymaking role in the U.S. government for responding to transborder data flow issues, the USTR said recently.

Appearing before a House of Representatives subcommittee last Monday, Geza Fekete-kuty, assistant U.S. trade representative for policy development, said his office is looking into whether it has "adequate resources to provide the needed leadership for dealing with the critical trade issues in communication and information."

The House Government Information and Individual Rights Subcommittee has been holding hearings on U.S. government response to international barriers to the free flow of computerized information.

Several U.S. industry witnesses have suggested the issue should be considered a trade question and not a technical or political issue and that the USTR should assume leadership in negotiating reduced national barriers to data flow [CW, March 31].

Subcommittee Chairman Richardson Preyer (D-N.C.) has expressed concern that U.S. government action in this area has been confused and uncoordinated. Presently, the Departments of State and Commerce handle data flow problems with the cooperation of the Federal Communications Commission and several other federal agencies, including the USTR.

'Competing Priorities'

Fekete-kuty told the subcommittee he is not convinced of the need for "a single agency or authority to take responsibility for international communications. We do not feel that the problems with the handling of transborder data flow concerns in the past can be attributed solely to organizational deficiencies."

Rather, he said, the problem in U.S.

government response to data flow problems has been one of "competing priorities and competition for assignment of resources to this area."

Neither industry nor government has long considered the issue a question of international trade, according to Fekete-kuty, who said the USTR is trying to determine if it has adequate staff resources for handling this issue.

USTR has recently established an interagency committee on trade in service; that committee will examine data flow problems. However, because of USTR's small staff it must rely on the expertise of other federal agencies.

"To a great extent, USTR's role in trade policy involves providing and encouraging interagency consensus on trade issues and assuring the rapid resolution of commercial problems," Fekete-kuty explained.

New Negotiations Necessary

There are few existing international trade agreements that USTR can build on to solve data flow problems, Fekete-kuty continued, and new international negotiations will be necessary in the long run.

To get ready for those negotiations, the USTR has begun working with U.S. services trade associations to work out responses to trade problems associated with U.S. service industries, including DP and telecommunications. The office is drawing up an "inventory of problems that inhibit trade in services," he said.

"In this context," the assistant trade representative said, "we have also begun to familiarize ourselves with current trade problems in the communication and information areas."

He outlined for the subcommittee several steps the USTR has taken to "build the international consensus needed in order to pursue services negotiations in the future." One action has been to introduce the question of services trade to the agenda of the Organization for Economic Cooperation and Development, which has been working on voluntary international data flow guidelines.

The USTR will continue its work on data flow issues, but Fekete-kuty said it is "premature" to hand his office primary responsibility for U.S. activity in this area.

The House subcommittee, which is not necessarily planning to introduce legislation to structure U.S. activity on transborder data flow issues, will continue its investigation of data flow problems in future hearings.

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BETHESDA, Md. — "Managing the Training Function," a series of three-day workshops for training directors, will be presented in several U.S. cities and Toronto between now and the end of the year.

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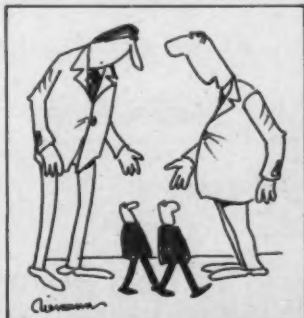
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Others Will Supply USSR

ITC: Soviet Trade Freeze Probably Won't Work

By Jake Kirchner

CW Washington Bureau
WASHINGTON, D.C. — The U.S. embargo of high-technology trade with the Soviet Union is not likely to be effective, according to the U.S. International Trade Commission (ITC), which said the Soviets will probably be able to acquire computers and other electronic equipment from countries other than the U.S.

The trade freeze, initiated in January by President Carter following the Soviet military intervention in Afghanistan, could also have adverse long-term effects on U.S.-Soviet trade by driving the Soviet Union into stronger trade relations with overseas competitors of U.S. companies, the ITC said.

The complete freeze has been lifted by the Administration, but the government has made it clear that little sophisticated electronic equipment will be exported to the Soviet Union except under extraordinary circumstances [CW, March 24].

In its most recent quarterly report to Congress, the ITC, an independent federal agency, said "an effective embargo of high-technology and other strategic items is expected to be... difficult, as electronic technology will most probably continue to drift into the Soviet Union through Western European and Japanese suppliers."

The report also speculated that diversion to the Soviet Union of items bound for East European countries would add to the undermining of the U.S. embargo.

Allies of the U.S. also have trade controls and have agreed not to undercut the U.S. effort, the report noted, but "previous experience shows that items which U.S. businesses were not allowed to sell were frequently made available to the Soviet Union from other sources."

This pessimistic assessment of the outlook for international cooperation with the U.S. trade restrictions is at odds with recent pronounce-

ments of the Commerce Department, which has expressed confidence in the support of U.S. allies.

The ITC view is more closely in line with that of the American DP industry, which has seen many of its sales to the Soviet Union rejected by U.S. regulators only to have them picked up by competitors overseas. Recently, U.S. DP

executives have expressed little hope that the Administration's action will be followed by other Western nations.

The ITC report continued that "the level of U.S.-Soviet trade stands to be severely affected by the new measures, as an overwhelming part of U.S. exports to the Soviet Union are now suspended." This situation will be aggravated by

"ripple effects" that might jeopardize future U.S. trade with the Soviet Union as well as with other Eastern countries, except China.

As time passes, the Soviet Union will establish alternative trade ties for items previously traded with the United States. U.S. companies, on their part, may decide that their investment in trading

with the Soviet Union (and possibly other [communist countries]) is too risky, and they may lose interest in these markets."

The ITC said "if the embargo lasts for an extended period of time, new trade alliances forged by parties on both sides might make the resumption of normal trade a long and difficult process."

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CPAs Say Chance Exposes White-Collar Theft

By Jay Woodruff
CW Staff

PLYMOUTH, Mich. — Most white-collar thieves are caught by accident rather than by audit or design, according to a recent survey of certified public accountants (CPA).

The survey results indicated that while the CPAs are responsible for designing security checks into their accounting systems, they most often expect to find evidence of criminal acts by chance rather than through a calculated effort.

The survey also revealed some surprising opinions about the motivation for theft.

More than 100 Michigan CPAs were given 25 statements about causes of white-collar crime and asked to rank them in order of their importance by the management consulting firm of George Odiorne and Associates. The statements had been taken from authorities in criminology, law enforcement and security who had advanced them as clues to why employees steal or embezzle from their employers.

The largest number of CPAs surveyed said there is no general rule why employees steal because "each thief has its own preceding conditions and each thief has his own motives." The second highest number picked the statement, "They feel they can get away with it and not be caught."

The statement ranked third was "Stealing a little from a big company won't hurt it."

Although the survey dealt with white-collar crime in general, Jack Bologna, president of the consulting firm, said its results can be applied to

white-collar computer crime as well. The majority of those surveyed do their audit work in a DP environment typical of that in which much of the

crime is carried out; only a few manual audits.

In Bologna's opinion, the statement that most white-collar thieves are caught by accident — which was fourth-ranked by the CPAs — surprised him more than the other high-ranked statements. "Their response may be the result of a growing recognition among management experts that there are no foolproof systems of internal controls, that most organizations have to operate on the basis of a reasonable amount of trust," he said.

Because an organization cannot completely eliminate the opportunities for crime, including computer crime, the organization should reduce its chances of being a target by "balancing controls with the work environment where people feel trusted and challenged," he added.

Accountants will someday be less dependent on chance as a way of discovering many types of white-collar crimes, Bologna predicted. "I believe that if we began to accumulate some reliable data on the matter, we would find that audits, controls and design features of systems do, in fact, pinpoint problems and provide a workable detection tool," he suggested.

Exhaustive research on white-collar criminals has not been done since 1965, he said. When it is done, it might provide some of the answers experts seek by getting as many profiles of the white-collar criminal from as many sources as possible.

'Foremost a People Problem'

By Jeffrey Beeler

CW West Coast Bureau

PHOENIX — Success in fighting computer crime depends less on technological safeguards than on the computing field's ability to promote high ethical standards among its members, according to DP security expert Donn Parker.

DPers could protect the integrity of their systems and data much more effectively by adopting a uniform code of ethics than by developing sophisticated software packages to restrict user access to files, Parker said here recently at Honeywell, Inc.'s annual computer security and privacy symposium.

"Computer crime is foremost a people problem, not a technology problem," the senior management consultant for SRI International, Inc. said.

The vast majority of illegal acts attributed to computers are not strictly computer crimes at all, Parker explained. In most cases, computers are incidental to the misdeeds, which usually occur before or during data entry and often involve some manual manipulation of

source documents.

By the time the manipulated data is converted from hard copy to electronic form, the so-called computer crime usually has already taken place. Only in a relatively few instances does a processor itself serve as the instrument of unlawful data manipulation.

Individual Integrity

To be truly secure, therefore, data has to be protected long before it finally finds its way into computer memory, Parker said. The integrity of computer-stored data depends on the uprightness of the individuals who handle it.

Computing professionals occupy positions of the highest trust within their organizations and are practically unlimited in what they can do with the data they are pledged to protect. If they choose, they can even misuse that data.

Because of the computing field's power to do both good and ill, DPers need to institute a code of ethics. DP professionals have to agree on what the ethical rules will consist of, Parker added.



Managers on the Move

GORDON RUNNER has been appointed vice-president of management information systems for Helmsley-Spear, Inc. in New York. Runner will be responsible for providing computing, systems development and technical consulting services to the firm's commercial, residential and hospitality businesses.

Prior to joining the real estate organization 18 months ago, Runner was vice-president of the New York Times Information Bank.

His 17 years of field experience also includes employment with IBM, Raytheon Data Systems and J. Walter Thompson.

• • •

HARLEY R. FERGUSON has been named vice-president of information services for Mid-Continent Telephone Corp. in Hudson, Ohio. Ferguson will be responsible for the systems and data processing department, as well as office services in Hudson.

Ferguson has served as director of Bell Dedicated Systems and of business systems for Bell Northern Software Research, Inc., a Bell Canada subsidiary. He also served as director of support systems for Bell Canada.

Ferguson received a B.S. degree in mathematics and physics from Carleton University in Ottawa.

• • •

JOHN F. DeCRUCCIO has been elected vice-president of information resources by the board of directors of



Ferguson



Runner



DeCrucio

Richardson-Merrell, Inc. He has been corporate director of management information services since 1973 in Wilton, Conn.

In his new position, DeCrucio will be responsible for corporatewide management information services, data processing and communications.

Before joining Richardson-Merrell, DeCrucio was associated with Western Electric Co., Bristol-Myers, Booz-Allen & Hamilton and Loew's Corp. He graduated from Lehigh University in 1955 with a B.S. degree in industrial engineering.

• • •

JACOB L. KATZ has been named DP director at Commodore International, Ltd. in Norristown, Pa.

Katz will be responsible for a network of distributed processing installations throughout the world.

He was formerly with Macmillan, Inc., where he served in a number of

managerial positions, most recently as manager of technical services.

Katz holds B.S. and M.B.A. degrees from Lasalle College.

• • •

SAMUEL J. MOSS has been elected a vice-president of Time, Inc. in New York. He recently joined Time in the newly created post of director of information systems.

Moss is in charge of Time's information systems and long-range planning for computer resources. A former senior vice-president of systems and communications with American Express Co., Moss holds an A.B. from Ripon College and a master's degree and Ph.D. in nuclear physics from the University of Wisconsin.

• • •

HARVEY NUSZ has been named DP audit manager at Rexnord, Inc. in Milwaukee.

Prior to his appointment, he was senior DP audit manager for Sundstrand in Rockford, Ill.

A graduate of the University of Houston, Nusz received a B.B.A. degree in 1971. In 1979 he became a Certified Internal Auditor and in 1975 a Certified Data Processor.

• • •

ROBERT A. PLAMONDON has been appointed director of information systems at Avco Aerostructures Division, a subsidiary of Avco Corp. in Newport Beach, Calif.

Plamondon will be responsible for all DP operations within the Aerostructures Division. Previously, he served as director of DP staff operations at Avco Financial Services' international headquarters in Newport Beach, Calif.

He served as a consultant to the Information Systems Division at Avco world headquarters prior to joining the company in 1977.

• • •

ANDREW P. LANGLOIS has been appointed director of management information services at Moore McCormack Resources, Inc. in Stamford, Conn.

Langlois has joined Moore McCormack after holding several executive positions at General Dynamics Corp.

He received a B.S. in mathematics from the Carnegie Institute of Technology and an M.B.A. from the Harvard University Graduate School of Business Administration.

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The Data Base



OECD to Study International Information Issues

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — A multi-year study of international computer and communications issues is taking shape in the Paris-based Organization for Economic Cooperation and Development (OECD).

Still in the planning stages, the agenda of the OECD Working Group on Information, Computers and Communication Policy (WGICCP) will give high priority to two topics advocated by U.S. representatives to the group — transborder flows of nonpersonal data and data communications policies, according to Arthur Bushkin of the National Telecommunications and Information Administration (NTIA).

OECD's willingness to tackle these increasingly controversial topics shows industrialized countries recognize that their social, economic and political futures will be greatly affected by the world's transition to an information economy, according to Bushkin, who represented the U.S. at a WGICCP meeting last month in Paris.

Bushkin, recently designated special assistant for information policy to NTIA head Henry Geller, told *Computerworld* the working group will also consider eight other information topics, including transborder flows of personal data; microelectronics and employment; R&D and industrial policies on information, computers and communications; and vulnerability of

computerized societies.

The term "microelectronics" will be broadened for purposes of the OECD work to "information technology," a change pushed by the U.S. at the urging of representatives of the U.S. DP industry. The industry representatives considered the term "microelectronics" too restrictive and said the word unfairly suggests that DP hardware threatens employment, Bushkin explained.

A third topic favored by the U.S. delegation to the WGICCP — trade in information goods and services — was not selected as a high priority for the working group's agenda. However, it will be covered as part of the consideration of transborder data flows on nonpersonal data.

Also undertaken will be an analysis of barriers to information trade and consideration of transborder movement of personal data as an economic issue as well as an issue of personal privacy.

The precise agenda for the WGICCP work will be set between now and the first week in October, when the working group will sponsor a high-level conference on DP and communications issues.

Guidelines Completed

A WGICCP subcommittee on transborder data flows recently completed work on voluntary national guidelines on restricting data flows. The guidelines, which essentially reflect the U.S.

position that countries should not unnecessarily impede the international transmission of personal data, are expected to be approved by the OECD Council of Ministers in the next few months [CW, March 17].

The WGICCP plans to follow the guidelines work with consideration of the social and economic impact of nonpersonal data flows. This has raised concerns in the U.S. about possible restrictions on the overseas operations of American multinational corporations.

That the working group has adopted U.S.-backed proposals for its agenda does not necessarily mean the impact on U.S. firms of data protection laws coming into effect in France, Sweden, West Germany and other countries will be moderated, Bushkin noted.

But the interests of U.S. companies will be represented at many levels, both public and private, beyond the OECD, he said. And "the substantive interchange" on these topics by the OECD is a positive step toward curtailing the international hysteria accompanying the advent of an information-based world economy, according to Bushkin.

"To the extent that we participate in this international dialogue and take these issues seriously, we have a chance to avoid some of these conflicts and problems that may arise," he remarked.

He predicted the WGICCP work will take several years and said the effort could lead to new levels of international cooperation.

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proximate travel dates and point of departure, how they expect to participate in congress activities, expected benefits from the congress and a statement agreeing to supply a post-congress report to Afips.

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Materials should be sent by May 30 to Nancy LeFebvre, Afips, Suite 800, 1815 N. Lynn St., Arlington Va. 22209, to the attention of Ifip Congress '80-Travel Grants. Announcements of the awards will be made June 30.

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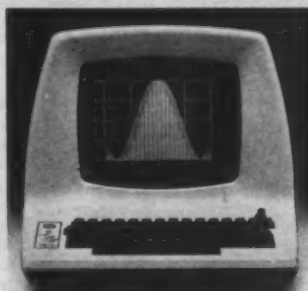
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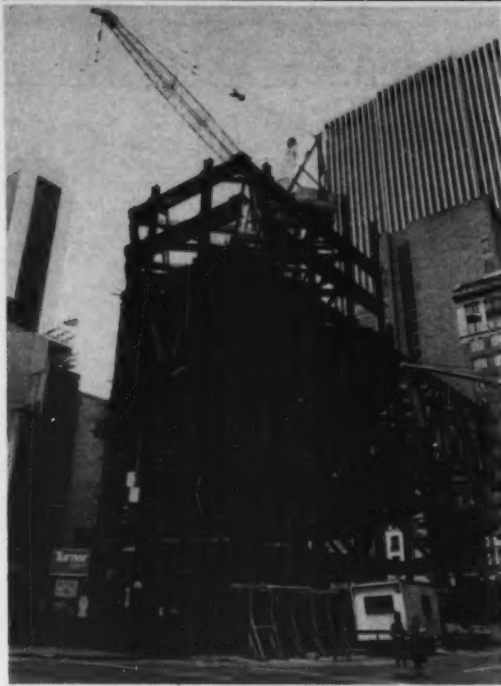
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 12 VP/Assistant VP
 13 Treasurer/Controller/Finance Officer
 21 Director/Manager of Operation/Planning/Marketing/Sales
 22 Director/Manager/Supervisor DP
 23 Systems Manager/Systems Analyst
 31 Manager/Supervisor Programming
 32 Programmer/Methods Analyst
 41 Chief Engineer
 42 Other Engineering
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New IBM Building

NEW YORK — Last year at this time, IBM's new regional offices for the Data Processing and Field Engineering divisions was only a hole in the ground.

When it is finished, this prism-shaped building in Manhattan will be 43 stories high with a gray-green polished granite exterior. The building will feature a glass-enclosed public plaza and a four-story greenhouse with 40-foot trees, IBM said. Scheduled to be completed late in 1981, the building will depend on computer technology to conserve energy.

Fitzgerald Gets Award For Auditing Achievement

NEW YORK — Dr. Jerry Fitzgerald, author and lecturer on telecommunications, systems analysis and internal controls, has been awarded the 1980 Joseph J. Wasserman Award in recognition of his outstanding achievement in the field of DP auditing.

The award, given by the New York Chapter of the EDP Auditors Association, was established to commemorate Joseph Wasserman, an early developer of DP auditing techniques, who died in 1978.

In giving Fitzgerald the award, New York Chapter President Edward Beddow cited his many published works, including his book *Internal Control for Computerized*

Systems. Fitzgerald is currently head of JFA, Inc., a California-based consulting firm.

Previous Winners

Previous award recipients include Donald Adams and Thomas Fitzgerald (no relation). "Adams is a CPA, and Tom Fitzgerald an internal auditor," Beddow noted. "Jerry's role as an author and consultant deserves equal recognition."

The award will be presented in New York on June 9. More information is available from Sally Meglathery, Guardian Life Ins. Co., Suite 18a, 201 Park Ave. S., New York, N.Y. 10003.

In-House User Groups Suggested To Improve Information Exchange

By Marcy Rosenberg
CW Staff

PHOENIX — DP professionals "gather all kinds of information but don't share it with anybody."

"As a result, we constantly reinvent the wheel."

This problem was identified at the IDMS users Association's Database '80 conference here recently by Craig M. Kellum, a data base consultant to RCA Corp. in Cherry Hill, N.J., and to its subsidiaries.

His solution: Form in-house user groups.

For RCA, an in-house user group formed in June 1978 addressed a "tremendous" logistics problem that had plagued the large divisions and subsidiaries and hampered communications among its DP personnel, he said.

Consisting primarily of programmer analysts, the group is expected to meet the following objectives:

- Share data base technology. The exchange of such information has helped new data base users get started, warned users of problem areas to avoid and educated them about specific software based on others' experiences with the products.

- Convey user requirements to the operations group. Group members invite RCA's systems programming experts in CICS and IDMS to attend meetings, impart their knowledge to programmer analysts and, in turn, learn what these users need.

- Document user and software problems. The group notes problems in writing, investigates them, feeds back problem sources to vendors and solutions to users and records all problems reported in a log. With the "problem" log, "we encounter the same problem only once, not 15 times," Kellum remarked.

- Track future directions in hardware and software technology.

- Present a united front to the vendor.

- Allow users to participate in developing standards.

Key to Success

According to Kellum, the key to the RCA user group's success lies in the way it is managed. The group is run informally by the users themselves. Management does not participate because its presence could inhibit users from airing problems and communicating openly, Kellum explained.

In addition, the group is run at a working level, encouraging participation by knowledgeable, technical persons.

Length of formal meetings is limited to one-half-day, leaving the afternoon for special interest groups which have tackled such tasks as evaluating data dictionary packages to recommend one to management that is based on user needs. The power of a group recommendation also makes it easier to sell product procurements to management, Kellum noted.

The group meets every six to eight weeks, a time frame that takes into account the distance some attendees must travel

and the costs required to attend. For RCA, the in-house user group "lets us do something to justify our salaries" by trading information and knowledge that can "keep management on schedule and from going down dead ends," he added.

Kellum stressed the need for in-house user groups to improve communications so wanting among DP professionals: "What kills us in this field is not knowing; we die every day because we didn't know any better."

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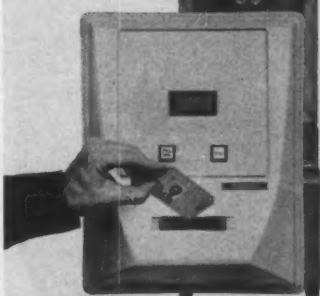
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EIA's Hyannis Conference To Cover Communications

HYANNIS, Mass. — Telecommunications trends and pressures that affect banking and other financial industries will be the topic of a three-day conference here May 27-29, sponsored by the Electronic

June Meet to Eye Word Processing

WILLOW GROVE, Pa. — The International Word Processing Association (IWP) will hold its "Moving Information — Concepts in Transition" seminar June 23-26 at the Minneapolis Convention Center.

The conference was expanded from three to four days to include a variety of panels, sessions and workshops on information systems, IWP said.

The conference costs \$150 for IWP members and \$200 for nonmembers, IWP said from Maryland Road, Willow Grove, Pa. 19090.

Industries Association's (EIA) Communications Division.

The fifth annual conference is designed to provide members of the financial community with an up-to-date briefing and overview of the status of the telecommunications industry. The event is divided into three panels composed of top executives from publicly held telecommunications manufacturing and operating companies.

The panels include "Communications for the Office of the '80s," "Equipping Networks for the 21st Century" and "Emerging Information Delivery Systems."

The cost of the conference is \$260, which includes seminar materials and some meals. Spouses may attend the conference for an extra \$65.

Additional information and registration papers can be obtained by contacting the EIA's Communications Division at 2001 Eye St. N.W., Washington, D.C. 20006.

May 18-21, Atlanta — Conference and Productivity Engineering Show, sponsored by the American Institute of Industrial Engineers. Contact: Jim F. Wolbrink, 25 Technology Park/Atlanta, Norcross, Ga. 30092.

May 18-23, Oak Brook, Ill. — Education Coordinators' Workshop. Contact: Deltak, Inc., 1220 Kenington Road, Oak Brook, Ill. 60521.

May 19-20, San Francisco — International Standard X.25 Interface Protocol for Packet Networks and Related Network Protocols. Contact: Data Communications Magazine, McGraw-Hill Conference & Exposition Center, Room 3677, 1221 Ave. of the Americas, New York, N.Y. 10020.

May 19-20, Virginia Beach, Va. — Annual Symposium on System Theory, sponsored by the Institute of Electrical and Electronics Engineers. Contact: Dr. M. Varanasi, Department of Electrical Engineering, Old Dominion University, Norfolk, Va. 23500.

May 19-21, Wellesley, Mass. — Data Base Design. Contact: QED Information Sciences, Inc., 141 Linden St., P.O. Box 181, Wellesley, Mass. 02181.

May 19-21, London — Materials Management Techniques. Contact: APL*Plus Ltd., 50-52 Chancery Lane, London WC2A 1HL, England.

May 19-22, Anaheim, Calif. — National Computer Conference, sponsored by the American Federation Of Information Processing Societies. Contact: Gerard Chiffreller, Suite 800, 1815 N. Lynn St., Arlington, Va. 22209.

May 19-23, Detroit — Systems Analysis Workshop. Contact: Pan-Core Consultants, Inc., Suite 200, 2 Northfield Plaza, Troy, Mich. 48068.

May 19-23, Los Angeles — Software Summit Series, co-sponsored by the Data Processing Management Association and American Institute of Aeronautics and Astronautics, P.O. Box 91295, Los Angeles, Calif. 90009.

May 19-23, Jackson Hole, Wyo. — Personnel Productivity in Data Processing. Contact: Keston Associates, 11317 Old Club Road, Rockville, Md. 20852.

May 19-23, Washington, D.C. — Predicting Throughputs, Response Times and Utilizations. Contact: Institute for Software Engineering, P.O. Box 637, Palo Alto, Calif. 94302.

May 19-23, New Orleans — Software Physics and Capacity Management. Contact: Institute for Software Engineering, P.O. Box 637, Palo Alto, Calif. 94302.

May 19-23, Washington D.C. — IMS Data Base Design. Contact: Data Base Management, Inc., 281 Hart-

ford Tnpk., Vernon, Conn. 60066.

May 20-21, New York — Financial Planning System Workshop. Contact: STSC, Inc., 747 Third Ave., New York, N.Y. 10017.

May 20-21, New York — Uses of Technology to Improve Managerial Productivity. Contact: The Yankee Group, Harvard Sq., P.O. Box 43, Cambridge, Mass. 02138.

May 20-22, Raleigh, N.C. — Distributed Computing Systems. Contact: QED Information Sciences, Inc., 141 Linden St., P.O. Box 181 Wellesley, Mass. 02181.

May 20-23, London — International Word Processing Conference. Contact: Online Conferences Ltd., Cleveland Road, Uxbridge, England UB8 2DD.

May 21-22, Teaneck, N.J. — Effective Presentations. Contact: QED Information Sciences, Inc., 141 Linden St., P.O. Box 181, Wellesley, Mass. 02181.

May 21-23, Philadelphia — Business & Personal Computer Sales Expo. Contact: George Pachter, Produx 2000, Inc., Roosevelt Blvd. & Mascher St., Philadelphia, Pa. 19120.

May 21-23, New York — Fundamentals of Finance and Accounting for the Nonfinancial Executive. Contact: The Wharton School, University of Pennsylvania, Dietrich Hall, Locust Walk, Philadelphia, Pa. 19104. Also being held May 21-23 in Houston and May 28-30 in San Francisco.

May 22, London — Introduction to the APL*Plus Financial Planning System. Contact: APL*Plus Ltd., 50-52 Chancery Lane, London WC2A 1HL, England.

May 22-23, Merrimack, N.Y. — Necon '80, sponsored by the Data Processing Management Association Region

14. Contact: Roger Proulx, Hesser College, 155 Concord St., Manchester, N.H. 03104.

May 22-23, Eugene, Ore. — Data Processing Management Association Region 2 Conference. Contact: Gary Kunkel, Eugene Water & Electric Board, P.O. Box 10148, Eugene, Ore. 97401.

May 22-23, Washington, D.C. — How to Find Information on Telecommunications. Contact: Information Gatekeepers, Inc., Suite 111, 167 Corey Road, Brookline, Mass. 02146.

May 22-23, Los Angeles — Computers in Litigation, sponsored by the University of Southern California Law School. Contact: Ronald Johnston, Irell & Manella, 1800 Ave. of the Stars, Los Angeles, Calif. 90067.

May 22-23, Kansas City, Mo. — Region 4 Conference and Exhibition, Sponsored by the Data Processing Management Association. Contact: Merle R. Aldridge, 4900 Oak St., Kansas City, Mo. 64141.

May 27-29, Turku, Finland — Nord Data 80. Contact: Turku Fair Corp., Puolalanatu 1 D 20100 Turku 10, Finland.

May 28-29, Chicago — Automated Office. Contact: American Institute of Industrial Engineers, P.O. Box 3727, Santa Monica, Calif. 90403.

May 28-29, London — Local Computer Networks, Sponsored by Data Communications magazine. Contact: McGraw-Hill Conference & Exposition Center, Room 3677, 1221 Ave. of the Americas, New York, N.Y. 10020.

May 29, Washington, D.C. — Trends & Applications: Computer Network Protocols, co-sponsored by the Institute of Electrical and Electronics Engineers and National Bureau of Standards. Contact: P.O. Box 639, Silver Spring, Md. 20901.

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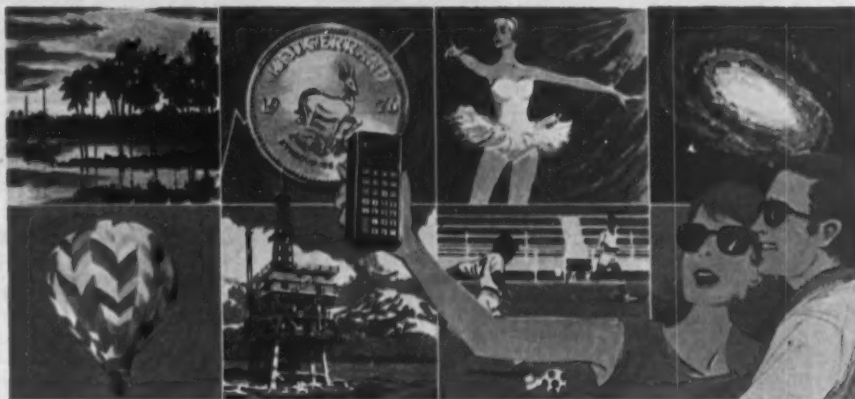
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State ADP Councils Form Umbrella Group

By Bruce Hoard

CW Staff

CONCORD, Calif. — The 22 Automated Data Processing (ADP) Councils in the U.S. have banded together to improve communications between state and local governments and federal management agencies such as the Office of Management and Budget (OMB).

The unified councils will also foster education programs for individual councils and their members.

Since the ADP Councils were mandated by the President and Congress in the mid-1960s and put under the sponsorship of Federal Executive Boards (FEB), the councils have worked predominantly on their own and with varying degrees of success, according to James N. Ridgell, temporary board chairman of the unified organization, known as the Federation of Government Information Processing Councils (FGIPC).

"Typically, we have had very little direct contact with the FEBs, and that's one of the things we would like to do something about," Ridgell said.

The FGIPC was born last December in Kenner, La., when the executive officers of 10 ADP Councils met to set up bylaws, establish a constitution and lay down objectives. Its formation represents the culmination of a two-year effort by ADP council member Clint Durland and Walter Haase of the Office of Management and Budget.

Possible Contributions

As an example of possible FGIPC involvement with the federal government, Ridgell said the group could help OMB provide facts on potential federal information processing systems to FEB and their counterparts in state and local government.

He listed federal property management and procurement regulations as another prime area for FGIPC input. Those two areas govern the use and purchase of computer hard-

ware, software and services.

From time to time the regulations change and, when they do, central management agencies in Washington are the major contributors to the future regulations. Ridgell would like to see the FGIPC have a hand in such multimillion dollar-type decisions.

The chairman stressed the democratic nature of the organization and said its leadership would "reflect the conso-

lidated views of the federation," which he called "a unique and not previously gathered cross-section of opinions."

Educational Programs

There are two areas of educational programs Ridgell would like to see the FGIPC address. They are large-scale programs of nationwide interest and smaller, more personalized courses to promote ca-

reer mobility.

He mentioned DP conversion as a likely large-scale topic. When federal agencies procure DP-related equipment and services, it is done on the basis of competitive bids.

Ridgell labeled that process "very difficult, costly, time-consuming and disruptive." A national education program dealing with it could greatly alleviate its pains, he said.

The second area of education

programs he favors pursuing are smaller in scale and would address several segments of DP management. Ideally, they would guide DP managers along a carefully planned and coherent career path.

The first meeting of FGIPC delegates representing all areas of the country will be held in Dallas May 1. Its purpose will be to rework and solidify the results of last December's initial meeting.

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Directory Lists Top DP Executives

PHOENIX — Applied Computer Research has published its spring 1980 edition of the *Directory of Top Computer Executives*, which lists top executives at more than 7,200 U.S. computer sites.

Including only Fortune 1,000-size companies — with gross revenues of at least \$50 million and/or a \$250,000 annual DP budget — the book lists executives in manufacturing, banking, insurance, retail and transportation.

The spring edition of the Directory costs \$95 per copy or \$150 for a two-volume, annual subscription including spring and fall editions. Applied Computer Research is at P.O. Box 9280, Phoenix, Ariz. 85068.

According to Dealer

Users Renting More, Buying Less

By Brad Schultz

CW Staff

BOSTON — Users are suffering more from recession than inflation, according to Computer Dealers Association President William Grinker, who told *Computerworld* recently that tight money has caused users to rent more and buy less from DP vendors.

Not that inflation is not hurting, Grinker said here that

many users are cutting discretionary areas in their DP budgets because of soaring costs, especially in personnel and supplies. Some companies have effectively slapped lids on DP spending, he said.

On the other hand, technological progress enhances the benefits DP resources can deliver to organizations, especially by boosting productivity, Grinker observed. That

means systems are still a wise capital investment — assuming the capital is available.

And there's the rub. On the theory that tight money will dampen inflationary pressures, the financial community has raised loan interest rates, making it more difficult for users to borrow money.

While money remains tight, users will engage in more rental acquisitions than they normally would, especially in doing business with IBM, Grinker said, because IBM's rental rates are much more attractive than the borrowing rates set by financial institutions.

The 20% prime rate that banks now charge their most favored customers actually implies that many users must borrow at about 33% to purchase DP equipment, Grinker estimated.

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COMPSAC 80 FOURTH INTERNATIONAL COMPUTER SOFTWARE & APPLICATIONS CONFERENCE, Chicago, Oct. 27-31.

Papers related to all areas of software applications are invited on such topics as software development methodologies, software requirements engineering, software management, data communications and computer networking, office automation, security and privacy, and mini and micro software.

Interested authors should submit by May 1 five copies of a paper ranging from 1,000 to 5,000 words. The package should include a 150-word abstract, all the authors' names, affiliations, addresses and telephone numbers and a statement of commitment that one of the authors will present the paper. It should be sent to Dr. Carl Davis, Data Processing Directorate, BM-DATC, P.O. Box 1500, Huntsville, Ala. 35807.

1980 COMPUTER NETWORKING SYMPOSIUM, Gaithersburg, Md., Dec. 10.

Sponsored by the Institute of Electrical and Electronics Engineers Computer Society, Technical Committee on Computer Communications, and the Institute for Computer Sciences and Technology of the National Bureau of Standards, the symposium will focus on office automation.

Papers of a tutorial nature, describing practical experiences or research, are invited. Interested authors should send, by June 30, four copies of a 1,000-word abstract to Frank Brignoli, Executive Office of the President, 726 Jackson Place N.W., Washington, D.C. 20503.

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Majoring in Computer Science

Appalachian State Student Wins ICP Award

BOONE, N.C. — A junior at Appalachian State University here has won the second annual International Computer Programs, Inc. (ICP) scholarship, worth up to \$5,000.

Daniel J. Alion was chosen on the basis of his cumulative grade point average in his major field, overall grade point average, need for financial aid, school activities and an essay

he wrote.

Currently earning his bachelor of science degree in computer science, Alion's winning essay dealt with "Height-Balanced Binary Sort and Search Trees vs. Binary Insertion Sort Search Method." His scholarly treatment of the subject — an investigation and analysis of the advantages of using height-balanced trees as

opposed to the binary insertion method for information sorting and retrieval — demonstrated his ability to present a technical treatment of the problem, ICP said.

Alion's classwork in computer science has been excellent, ICP added, and the rest of his studies mark him as an outstanding student. He was cited as "the best programmer

in the class" by Edward Pekarek Jr. of the Department of Mathematical Science at Appalachian state. Alion proved to be "the brightest and most highly motivated student in the class," Pekarek said, referring to the student's first class standing in algorithms and programming.

Alion is a student member of the Association of Computing

Machinery. Last fall he participated on a student programming team in the ACM regional programming contest.

He is active in extracurricular activities, has been a student consultant for other computer science students and has worked to help organize a departmental lab for the university.

Robert J. Winner, associate professor, stated that his student "consistently turns in professional programs clearly indicative of the craftsmanlike approach we wish all programmers would espouse."

Course Features Cobol Training For Programmers

OVERLAND PARK, Kan. — A structured Cobol course for programmers without prior structured programming or Cobol experience is available from Edutronics/McGraw-Hill.

Developed in conjunction with DP and management authors Dr. Andrea S. Philippakis and Dr. Leonard J. Kazmier, the course features a series of videotapes and workbooks that integrate training in Ansi Cobol and structured programming, the vendor said.

The course is applicable to any type of system using a Cobol compiler. It takes 80 to 120 hours to complete and is part of Edutronics/McGraw-Hill's DP library.

The eight-module course is available to nonsubscribers for \$625/module, the vendor said from 55 Corporate Woods, 9300 W. 110 St., Overland Park, Kan. 66210.

August Meeting On Simulation Set for Seattle

SEATTLE — The 11th annual Summer Computer Simulation Conference scheduled here Aug. 25-27 will focus on the use of computers in modeling real and proposed activities, with mathematical and logical formulas representing the subject.

Papers to be presented at the conference include the simulation aspects of such things as physical, chemical and nuclear sciences; biological, medical and ecological systems; graphics; management sciences; socioeconomic models; training models; dynamic systems; and energy and resource utilization.

More information is available from Katy Lang, publicity chairman, Boeing Computer Services, P.O. Box 24346, Mail Stop 87-06, Seattle, Wash. 98124.

"Because we compete on the basis of service, the Fastrain Printer was the better business decision."



Carlson Marketing and Motivation (CMM) is one of the world's largest premium/incentive organizations. Comprising some six operating companies and providing a very diverse range of services, CMM requires exceptional computer resources. E. C. "Skip" Gage, president and Ed Frandle, director of operations, discuss some of these requirements.

Gage: "We're totally service-oriented, and in the last few years our growth has been almost explosive. Obviously data processing is a very important part of our delivery system."

Frandle: "Right now we have ten different data centers to serve our clients. We need not only the capacity to handle the volume, but also the flexibility to handle the complexity of our operations. That's why we chose Control Data's 32111 Fastrain printer—it gives us almost twice the throughput of a 1403 and yet it's completely compatible with our hardware and software. The Fastrain even accepts our existing carriage control tapes, so conversion is transparent and painless."

Gage: "We were also impressed by its print quality and reliability. Both were exceptional, given that it operates at 2000 lines per minute."

Frandle: "That's right. In one three-month period, it cranked out more than 60 million lines with perhaps one hour of downtime. I think that's pretty good reliability."

Gage: "We're getting almost twice the speed and print quality that's as good if not better. We're getting service and support whenever we need it. We're getting greater ease of operation and greater ease of conversion. For us, the Fastrain was the better business decision."

Perhaps our Fastrain printer is the better business decision for you. Call 612/553-4029 or contact your Control Data representative.

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Do Vendors Ever Really Retaliate?

Q Do vendors really ever retaliate against users?

A I find it hard to believe that a vendor would make a conscious attempt to retaliate against a user of its product. This would be a classic case of cutting off your nose to spite your face.

Typically, the link between the vendor and the user is the marketing representative. Derogatory statements by a user about a particular product usually result in an increased effort by the vendor to satisfy the user.

On the other hand, a comment that reflects poorly on the marketing representative may cause the representative to unconsciously slight that account in favor of others — perhaps in retaliation.

A close examination of the clients of virtually any marketing representative will show inequities in their treatment. These inequities could be the result of any number of circumstances.

A marketing representative might retaliate against a user that discusses vendor problems with potential clients, reporters, etc., but that is not likely. In fact, it has been my experience that users tend to sugarcoat evaluations of products they use. I always temper their remarks with this in mind.

When a user publicly denounces a DP product, you can bet that product and/or the service is pretty bad.

Circumstances under which marketing representatives "retaliate" or slight the company may occur when a user replaces some or all vendor peripherals or memory with plug-compatible counterparts; when user personnel constantly badmouth the equipment or software product with associates in a local area; when the DP manager refuses to accept or even consider the marketing representative's recommendations for future upgrades; when the company is locked into a particular vendor, for whatever reason; when there are no potential sales during the commission period; and finally, when the marketing representative, or the vendor, assesses the account as "more trouble than it's worth" and forgets it in hopes the user will terminate its contract.

Q Our company first bought a computer in 1959. Since that time our data processing function has experienced a rapid growth in people (three to 400) and equipment. The entire operation is centralized.

I was appointed to serve as the Accounting Division's representative on a committee formed two months ago to select the hardware for decentralizing our DP operations. I'm the only user on the committee, whose emphasis so far has been on developing specifications for benchmarks.

Although reasonably computerwise, I have been unable to help in the development of these highly technical specs. The committee is going around in circles trying to identify circumstances that can be used to equitably evaluate the various alternatives.

Having no previous experience in hardware selection, I would be interested in knowing if other companies devote so much time to preparing benchmarks and how much emphasis is placed on benchmarks in the evaluation process.

A The benchmark gained tremendous popularity 15 years ago because one vendor's computer system could be configured like another's. Therefore, qualitative evaluations could be made relative to performance. Not so any more.

A computer system is much more complex today. With so many variables, the results of a benchmark will probably require an asterisk or two that negate the possibility of any real

comparison.

As an alternative to benchmarks, consider using performance data compiled by current users to validate the vendor's claim.

Under most circumstances, benchmark results can't be interpreted and have little real value. In the final analysis, other factors play a more vital role in the hardware evaluation and selection process.

Cost, vendor reputation, service, compatibility and the availability of support software are much more critical to success.

I hope you are selecting hardware based on a comprehensive applications systems plan. It seems as though DPs often become preoccupied with hardware and find themselves devel-

Turnaround Time

By Larry E. Long



oping systems to accommodate the hardware, rather than selecting hardware to accommodate the systems.

Have a question? Send it to Larry Long, Editorial Department, Computerworld, 375 Cochituate Road, Rt. 30, Framingham, Mass. 01701.

Long is a professor at Lehigh University, a DP consultant and author.

While you're waiting, Wang's VS could be working.

If you're waiting for an IBM System 34 or 38, you've got a lot of time on your hands. So why not take a few minutes and closely consider just what you'll be getting a year or two down the road. Most importantly, consider your options.

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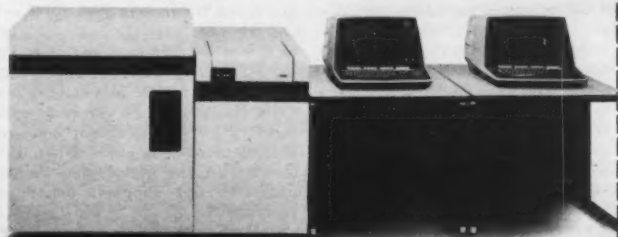
investment. With Wang's VS, you also get interactive RPG II programming with compilations 5-10 times faster than those on the System 34. Extensive program development aids. On-line and batch operations. Telecommunications. COBOL and BASIC. A fully supported data management system. Up to 4.6 billion bytes of fixed and removable disk storage. And a data compaction feature that could cut your storage requirements by at least a third.

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EDITORIAL

Financial DP Overtaxed

The Carter Administration apparently fails to appreciate the extent to which public policy impacts the DP resources of regulated industries. The nation's financial institutions face the prospect of costly system conversions and procedural changes if recent inflation-fighting proposals by the Federal Reserve System and the President take effect.

To implement those credit-tightening measures while meeting obligations to notify customers of credit policy changes, financial institutions would have to assign monumental software rewrite projects to their DP departments [CW, April 21]. Those projects would probably take at least a few months to complete and would substantially increase the demands on facilities that in many cases already run at full capacity.

But the federal government wants substantial credit tightening right away on the theory that excessive borrowing is a principal cause of inflation. The Federal Reserve System has ordered financial institutions to increase new lending by no more than 9% annually and to hold in Federal Reserve accounts 15% of the amount of money they loan through revolving credit services.

Those and other actions compel banks, savings and loan institutions, credit unions and finance companies to revise software supporting their customer services, software supporting their internal accounting functions and software supporting their interactions with government.

Among customer-oriented applications that await revisions are the software used to process credit applications, the software used to monitor account delinquencies and the software used to notify customers of changes in methods of calculating finance charges.

Financial institutions face a grave risk of system malfunctions if they rush to complete such software revisions without adequately ensuring their integrity. Unless the rewritten software is appropriately implemented, the tighter credit controls will be applied inequitably, creating grounds for considerable litigation from an abused public.

A regulatory action always affects the DP resources of the regulated industry and therefore warrants justification from that standpoint. This is especially true for industries heavily dependent on DP.

By overtaxing the processing resources of financial institutions, the Federal Reserve actions may hurt the public they were supposed to help.

DATA PAST

Five Years Ago April 23, 1975

WASHINGTON, D.C. — Bolstered by a new federal law, the Department of Health, Education and Welfare (HEW) launched a major computer-aided effort to assist states in locating runaway parents and compelling them to support their children, thus easing the taxpayers' growing welfare burden. Effective July 1, 1975, HEW's Social and Rehabilitation Service was scheduled to officially centralize the parent-locating business using a time-shared network and the master files of the Social Security Administration and the Internal Revenue Service.

rotating mass memory area. The new firm, known as Magnetic Peripherals, Inc., would be owned 70% by CDC and 30% by Honeywell and would make products for the parent companies, which each would sell to its respective customers.

Eight Years Ago April 19, 1972

WASHINGTON, D.C. — Region 3 of the General Services Administration issued standardized job descriptions for DP personnel services as part of a Basic Ordering Agreement that required software firms to post standard prices for various services.

MINNEAPOLIS — Control Data Corp. and Honeywell, Inc. agreed to establish a joint venture to design, develop and manufacture disk drives, drums and associated controllers as well as possible future products in the

WASHINGTON, D.C. — Federal Power Commission Chairman John Nassikas warned that DP users in some areas of the U.S. would be threatened by power shortages during the summer.



'No kiddin' — I heard a rumor the "honor system" may be in deep trouble ...'

LETTERS

The Real Schism

It was time someone challenged the Association for Computing Machinery (ACM) for its establishmentarianism (golly, I thought I'd never have a chance to use that word!). The fact that Dr. Herbert R.J. Grosch was the one to do it came as no surprise, considering his apparently critical views of a certain computer manufacturing/-marketing company and its policies.

Although *Computerworld* cited the struggle between ACM's "academic establishment" and the "practitioners" as the basis of the alleged election abuses [CW, April 7], I believe it more accurately reflects the long-standing division brought about by those establishment persons heavily influenced by self-serving loyalties to that certain computer company and those who challenge the credibility of its policies and products.

As one of the latter in the early '70s, I was a candidate for the office of vice-chairman of the (San Francisco) Peninsula Chapter of ACM. I, too, felt the sharp edge of the ACM "censor's" blue pencil as my candidate's statement was castrated by those good folks on the establishment's nominating panel.

I narrowly lost this election (but was never allowed to know the exact count) and attributed the loss largely to that "editing" job.

Actually, I was less disturbed at the loss (I was feeling lazy anyway) than I was incensed over the heavy-handed tactics of the person responsible for muting my points of contention, which dwelt not on personalities nor petty politics, but on the real issues concerning professionalism and the exercise of clout in our dealings with our marketplace (employers, clients) and with our suppliers (computer companies).

I wish Grosch well in his challenge,

and I hope he will broaden the scope of the lawsuit. Considering probable long-standing and widespread ACM establishment abuses, perhaps it should be a class action suit.

Name Withheld by Request

Inherent Vulnerability

I would like to respond to the anti-IBM views expressed by *Computerworld* readers. This sentiment was epitomized by Edward C. Charbonnet's kangaroo court attack on IBM [CW, April 7].

Charbonnet claimed "IBM's aggressive pricing of the 4300 decimated many members of the plug-compatible market."

To set the record straight, only one plug-compatible manufacturer (PCM), Intel Corp., suffered major losses resulting from the 4300. The loss was largely a result of Intel's inept management.

Despite the fact that the 4300's price/performance was publicly known — to a first approximation — a full year in advance of its announcement, Intel's marketing strategy was, "Damn the torpedoes, full speed ahead." When every other PCM was cutting production, Intel was expanding.

Charbonnet fails to understand that PCMs, by their very nature, are vulnerable to marketing ploys by IBM. But the PCM knew of its vulnerability when it committed itself to marketing plug-compatible machines.

Indeed, some of IBM's marketing tactics are questionable. However, to deny IBM the right to market new products and to adjust the price of those products is to deny IBM access to the free enterprise system.

Christopher Lamb

Swarthmore, Pa.

Other letters on Pages 32, 34 and 35.

HUMAN CONNECTION/Jack Stone

Medieval Guilds Staging Return in DP Ranks?

From Webster's *New World Dictionary* — "guild: in medieval times, a union of men in the same craft or trade to uphold standards and protect the members."

Is it possible that the organizational strategy of work groups in centuries past has been resurrected and is now alive and thriving in our industry? Well, historian/programmer/analyst John Boddie has presented a compelling theory for it, one which he uses to explain why mutual respect between DP and the rest of the business is lacking. He makes a very good case, in my judgment:

"I liked your Dec. 10 article 'What Makes Programmers Run?' But I

found it shared a common problem with many articles of its type. It concentrated on the 'ideal' example of systems department motivation within an 'enlightened' company. When 69 out of 70 people you questioned said they didn't enjoy management support, a closer examination of their problems might have had more practical information for your readers.

"Why don't programming groups enjoy management support? Let me suggest a reason. Systems groups don't enjoy the support of management because they don't want to operate in a manageable fashion.

"Programming is a craft and its practitioners act like craftsmen: Apprentices (junior programmers) are given

the mundane tasks such as making sure that the report columns line up. Journeymen (programmers) have learned a subset of Cobol or RPG or some other language and can do a payroll program over and over, often making the same mistake. Master craftsmen (systems programmers and analysts) know about JCL and Sysgens and can read dumps.

"This [characterization may be] a little unfair, since there are people at each level who are clearly outstanding and who can design systems that work well and are delivered on time and within budget. But no matter what the level of competence, the programmers

band together like a medieval guild. Its members guard the arcane secrets of their craft. Management is regarded as an intruder in the guildhall and programmers expect a show of deference when management wants a new system to be developed.

"The DP manager is often ineffective in providing a bridge between the two groups. Many managers have risen through the guild and retain their distrust of management. The DP manager who comes in without a programming or systems analysis background will often find that the guild will not give him the respect necessary for leadership.

"In many companies, management doesn't have either the time or the inclination to deal with the guild on its terms. The management of a company may feel that it should not need to treat its DP group any differently than it treats its purchasing group or its accounting staff. I think management has a point.

"When you find a situation where the programming manager is complaining that management doesn't know what it's asking for when it demands a new set of reports and where management is complaining that the DP group isn't giving the required information that is needed in the decision process, you can be pretty sure that the guild mentality is at work.

"The way to break the impasse is probably through the junior programmers. If DP management gets them out talking to the people who use their product, they may begin to see themselves as an integral part of the company. (Continued on Page 34)

THE TAYLOR REPORT/Alan Taylor

Forth's Future Bears Watching

The DP industry now has a chance to watch an exciting new form of our science pull itself up by its bootstraps.

Eighteen months ago, the Forth Interest Group (FIG) was practically just a roomful of enthusiasts, and now it is a worldwide organization going places. FIG now has enough members and sales to be able to hire paid staff for distribution purposes. It has more than 1,000 members — most of whom have joined in the past 12 months — and continues to distribute public-domain Forth compilers for users and vendors alike, as previously reported here [CW, Aug. 13, 1979].

FIG's progress is important in that it is demonstrating a pattern of software progress free from hardware and commercial restraints.

The 1979 Forth standard has yet to be published but has been agreed upon, so the language has a solid base. The work has taken some four years, but cooperation with the European Forth community has been good, and publication is now a matter of editing and printing delays only.

Application Language Development

The important point about Forth as a language is that it builds from the machine code, through the Forth primitives, into application-level verbs, operands, macros, editing and verification systems without any use of multiple standardized interfaces such as JCL, operating systems or even languages. The Forth programmer can define and then immediately use new verbs which are entered into the language capability in much the way that a new story can be added to a skyscraper without disturbing the architectural planning.

The difference between Forth and Cobol architecture is similar to the difference between the architecture of two-story Colonial houses and that of skyscrapers. There is a higher level place in the Colonial house as in Cobol — the upstairs story and the "source" language. There can be a second, even higher level one — but that normally becomes cramped as the needs of the roofing get in the way of the attic windows. And, that's about as far as Cobol or Colonial go.

All Cobol-style compilers are basically like this. They are themselves high-level to a certain extent. And there are advanced forms with some specialized thinking, too. But all Cobol-based systems expect the programmers to use, or at least read, the standard generalized Cobol language and to manipulate it.

In Forth, by contrast, programmer A can and normally does, as a standard part of his program writing, add new, application-oriented facilities and verbs; and the subsequent programmer B need never go down to the rather mathematical requirements of the Forth primitives.

The available pool of application programmers is increased as is the productivity of Forth programmers and the number of installation standards that can be maintained. And Forth keeps its advantages of minimized space and remarkably powerful operational speeds.

User-Support Economics

The one thing Forth does not really have is an economic base from a commercial concern like a hardware vendor or a software supplier. Instead, last year FIG took the unprecedented step of providing public-domain compilers (Continued on Page 34)

READER COMMENTARY/David J. Connelly

Beware of Limit-of-Liability Clauses

The Taylor Report of March 10 described three issues which, if present, would ensure a "reasonable" contract for the purchase of a computer. According to the article, a "reasonable" contract must contain a detailed system description, a precise delivery schedule and a statement concerning ownership rights.

While I completely agree that these items are essential, I do not necessarily agree that their mere presence is sufficient to make a contract "reasonable."

Typically, the purchaser of a computer must be concerned with two goals: to ensure that his DP requirements are satisfied and to provide for adequate legal protection in case subsequent problems develop. While the article addresses the problem of satisfying the purchaser's processing requirements, it does little to afford him the legal protection associated with a reasonable and equitable contract.

Invariably, every vendor standard sales contract contains a limitation-of-liability clause to limit the vendor's potential damages. A contract can never be reasonable and

equitable to the purchaser in the presence of this clause. Basically, this clause is intended to protect the vendor if the computer does not perform as represented and causes extensive damage to a purchaser's business.

Faced with this potential defense, it is very unlikely that the purchaser will succeed in any litigation against the vendor. The net result is that the purchaser may suffer extensive damages, financial and otherwise, with only limited recourse against the vendor.

Vendor Insulation

The insulation of the computer vendor from unlimited liability is analogous to that of the automotive industry in its earlier years. The standard automotive sales contract limited the liability of car manufacturers and dealers for damages caused by "defective" cars. Since this clause was standard throughout the industry, the public's only choice was to accept these conditions or not purchase a new car.

Although a limitation-of-liability contract may be valid under some circumstances, the courts held the

clause to be unconscionable in this situation since the public had no realistic alternative but to comply. Similarly, it may be argued that the presence of a limitation-of-liability clause in the standard computer contract is unconscionable since it does not afford the public a viable alternative.

It must be recognized that any reduction in the vendor's protection under the limitation-of-liability clause will translate into increased cost for its computer system. The increase in price will be a direct result of the vendor's assumption of greater financial risks. Essentially, this would allow the vendor to spread potential losses over all of its customers. Under this scheme, an innocent purchaser will not suffer onerous losses as a result of a defective computer.

In conclusion, I reemphasize that I completely agree with the Taylor Report as far as it went. However, from a legal perspective, I feel it may be misleading and did not address several essential issues.

Connelly is an attorney based in Bricktown, N.J.

A Use for Used CPUs

I recently attended a show-and-tell given by Magnuson Systems Corp. Its IBM substitute was certainly impressive. Users of the IBM 370/135 and up are the target customers, but these folks have a quandary: what to do with the old machine.

Speaking for us, and probably hundreds of other similar institutions, let me make a suggestion. Western Maryland College is a nonprofit private educational institution. As such, we can accept donations, monetary and otherwise, and the gift is tax-deductible to the donor.

In the case of hardware, you can deduct the depreciated value of your CPU. This is likely to be an order of magnitude greater than its actual market value. The realization in tax benefits to your corporation are therefore likely to exceed the market value. In

other words, it's a good deal for all of us.

We cannot afford to buy a 138, even at the depressed market value, so you can be sure this is about the only way we have of providing the services our organization requires. We have nearly outgrown our 370/115, and we'd be delighted with your 135 or 138.

Emily G. Johnston
Director

Computer Center
Western Maryland College
Westminster, Md.

A Data Base Approach

I agree with Michele Landon's commentary, "Data Bases Not Ultimate

LETTERS

Answer" [CW, April 17].

The software that converts any group of data files to a data base probably comes closer to being the ultimate answer — at this time. We want to do with the data files those organizing steps that the mind would do without a computer.

Greater programming power and flexibility are what we really need, in any environment, without regard for whether we have a data base.

The data base management system (DBMS) utilities that one buys become more important than making an overarching data base itself. Specifically, high-quality (fast, inexpensive) utilities that convert files to data bases, add secondary keys and so forth are what

is needed to really get going.

The benefits of the data base are truly stated in terms of increased programmer productivity. However, the barriers to getting a full-fledged data base up and running may make the benefits seem distant indeed.

For example, my firm has files from many sources, all in different formats. It desperately needs a data base management system. However, organizational problems seem to effectively preclude all the various file "owners" from ever getting together and creating a logical structure.

My first solution was to Cobol and Fortran every job that required integrating files. The next (very short) effort was to suggest a data base. I realized very soon the organizational problems (and my folly) and reviewed what my next course of action should be.

I came to this conclusion: Pretend that I have a data base.

It was a practical decision because of the ease of file conversion and data base set-up available from our vendor, Computer Sciences Corp. If I have a job to do now, I find the files I need, convert only the parts I will use to a small data base and then run my reports with the easy-to-use query language. I drop all files created in the run after completion.

It is faster by an order of 10 or better in hours spent programming and debugging. It makes the unusual, ad hoc crisis requests trivial instead of horrible.

I have thus used the various files as a data base, but I have done it without the organization per se. It really is making the DBMS utilities an aid to programmer productivity — and powerful ones at that.

I have concluded now that the data base idea is much like the distributed processing idea: Whether you have one or not doesn't matter. What counts is whether you are reaping the benefits of the advanced technology — and doing so without going through the bloody organizational battles. I could say that I have a data base. Well, almost.

A nice side effect of this has been the development of general DBMS skills. If we go DBMS, I'll be ready. Setting up data bases is a daily job for me.

Finally, just in the last few days, a significant part of our most commonly used files are going data base. As I see it, that is nice, but hardly a real concern for me. I have the power to do the jobs either way. The DBMS utilities are really the key to productivity.

William Amborn

Santa Rosa, Calif.

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Without Loops

Clyde E. Miller's commentary "Structured Programming in Cobol Needs Help" (CW, April 14) contained an example of structured Cobol which uses two loops and eight statements (not counting END WHILEs) to accomplish what can be done with no loops in three statements.

Assuming the data declarations PURCHASE PIC V99, BALANCE PIC 99 and REM PIC 99, with PURCHASE greater than zero, the function is easily done by:

```
COMPUTE BALANCE = 100 * (1.00 - PURCHASE)
DIVIDE 25 INTO BALANCE GIVING QUARTERS
REMAINDER REM
DIVIDE 10 INTO REM GIVING DIMES
REMAINDER PENNIES.
```

Really, Miller's code requires nine statements since MOVE ZERO TO QUARTERS, DIMES is needed as an

initialization. I would guess that after a precompiler finishes transforming the WHILE statements, the final Cobol code will contain four paragraph names, four GOTO statements and two IF statements to implement the loops.

Precompilers are nice, but perhaps a better problem could be found to demonstrate their usefulness.

Roger House

Sebastopol, Calif.

Cobol Compiler

In his March 31 letter, Robert Higgins made several good points that we have implemented in our Virtual Cobol compiler for the IBM Series/1.

For just the reasons he gave in his letter, we use two registers instead of one to keep both the occurrence number and the storage-displacement for INDEXED data items. We also dynamically attach at runtime CALLED subroutines, so our users don't have to link-edit.

Among other reasons, I believe that higher level languages exist to 1) make things easier for the application designer and programmer and 2) allow

system efficiency choices to be made by system software.

When computers cost more than \$500,000, throughput dominates most environments (why else would IBM have invented LINK-EDITING and made it popular?). Now that computers cost less than \$20,000, programmer efficiency and software ease of use are more important. When computers cost less than \$200, ease of use and flexibility will be most important.

Robert T. Lindsay Jr.
President

Advanced Software Products, Inc.
Delray Beach, Fla.

Forth Bears Watching

(Continued from Page 31)
and so spread its use. The idea was that FIG membership fees and the sale

of publications would be able to support matters.

The idea has worked! There are now a number of commercial sources of supported compilers with documentation for many mini and micro systems.

May 20 will be Forth Day at the National Computer Conference. Papers will include details of translators that take Basic, Pascal and so forth as input and output Forth — again showing the independence of the language.

But, I think even more important are the papers about applications that are both complex and dynamic — such as portable respiratory intensive care systems, offshore oil and building management systems. In addition, of course, is Forth's old standby, radio astronomy.

The real experts, who are still developing their subjects, will no longer have to learn a foreign discipline designed without their application in mind. Instead, they will be able to work with a tailor-built system ready for their own environment and able to be developed by them as their needs change.

Hopefully, Forth's developments have not stopped and will spill over into many other areas of DP to everyone's advantage, for FIG's experience has something to teach us all about the software we use today and hope to use tomorrow.

(FIG can be reached through P.O. Box 1105, San Carlos, Calif. 94070. Annual subscriptions are \$12 in the U.S., Canada and Mexico and include six issues of the *Forth Dimensions* journal.)

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Guilds Staging Return in DP?

(Continued from Page 31)

pany.

"As long as programming staffs are more concerned with JCL than with the utility of their output, management is sure to regard them as a necessary evil. It's hard to find a management that gives unstinting support to a necessary evil.

"Enough of theory.

"I think you're providing a real service in giving us a regular column on cybernetics. The relationship of man to machine provides some of the most interesting and worthwhile problems for examination that can be found in the industry."

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Tension and CRTs

Before any articles on the tension created by the use of CRTs lead to lengthy sociological, psychological or governmentally financed programs [CW, Feb. 25], the following should be considered.

For years, clerical staffs, including their supervisors and managers, have used the excuse that they got work to DP, but that DP could not do what was expected of it.

Usually, what this meant was that the particular user cleared his desk toward the end of the day. Having thus dropped his inefficiency on the Data

Entry Department, he went on his way.

Now there is no Data Entry Department to blame. Now, with the introduction of the CRT, the user must become as efficient as he has claimed to be all along.

The only study that should be done is to determine whether we are dealing with tension, guilt or embarrassment in being found out.

Philadelphia, Pa.

Don Roberts

LETTERS

Teaching Fortran

I was disgusted by the shortsightedness of the answer in "Turnaround Time" regarding the use of Fortran in business applications courses in educational institutions [CW, March 17].

The suggestion that the presentations on programming can be reduced by backing off to the programming language Basic clearly indicates that the author doesn't understand the difference between understanding program-

ming and knowing a language.

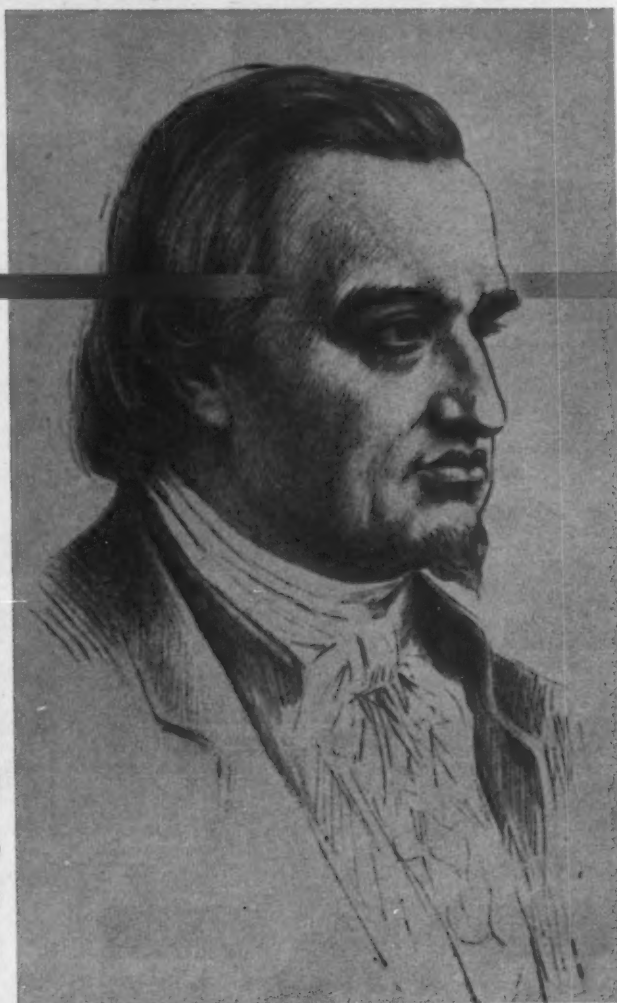
Maybe it was one of the author's graduates who recently informed me that it was a waste of time to teach verification and correctness to our sophomores since there was no way any program could be made to be correct.

The answer's premise appears to be that teaching a programming language is equivalent to teaching computational techniques. I hope that the author is not proposing doing business with the European Common Market after simply learning French.

J.A.N. Lee

Department of Computer Science
Virginia Polytechnic Institute
Blacksburg, Va.

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For Honeywell Level 66 Users Library Management System Uses Gcos

PHOENIX — A source and object on-line library management system for Honeywell, Inc. Level 66, Level 66/DPS and DPS 8 computer systems that use the Gcos operating system was developed by Information Systems Consultants, Inc. (ISC).

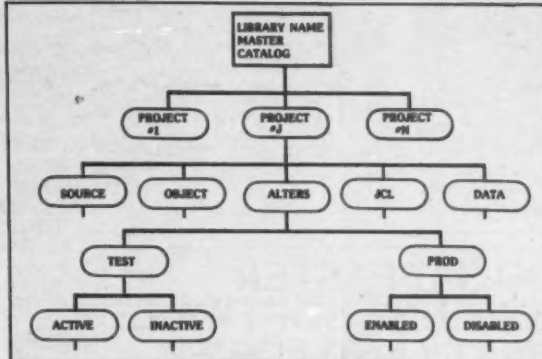
Called Soloman, the system uses Gcos file structures to maintain the System Master Catalogue as well as source, object, JCL, alter and data files needed to facilitate library management, ISC claimed.

Said to reside and execute in 88K bytes of time-sharing memory, Soloman requires a front-end network processor with 16K words of memory to handle on-line activity. Software requirements include Release 4/J or later of Gcos III, Honeywell's Text Executive Processor (TEX), time-sharing and appropriate communications software.

Features of the system include a compressed format to minimize disk storage requirements; English-like commands; file protection through access control, security and integrity checks; and full audit trail provision for activity against library members and for individual terminal sessions.

In addition, Soloman allows access to Gcos time-sharing and user commands and supports all major Honeywell languages, including Cobol 68 and 74, Gmap, Fortran, PL/I, IDS-I and II and Algol.

(Continued on Page 40)



The user file structure of Soloman, an on-line library file management system for Honeywell users from Information Systems Consultants, Inc.

Cullinane Delays 'Escape,' Documentation

By Marcy Rosenberg
CW Staff

PHOENIX — Cullinane Corp. has delayed delivery of Escape, its software product that gives IDMS data base management system users DL/1 interface capabilities to IBM's IMS, from the second to the fourth quarter of this year.

Nick Rini, Cullinane's director of software development, admitted the product is still in the development phase and requires further quality testing.

Also arriving late to users' doorsteps in some cases has been documentation for new data base-related product releases from Cullinane.

The firm said it plans to address the problem of late arriving documentation through its newly formed management committee, which includes separate documentation and software development groups.

Manual Development

The software development group's charter is to develop "preliminary" manuals to be delivered with all new products and releases. These "initial cut" manuals will be produced in rough form in machine-readable format to give users something to work with at product delivery time, Rini explained.

In the past, users often were forced to wait

for the better graphics-quality finished manuals that typically take the documentation group six to eight months to produce.

Speaking at Database '80, the IDMS User Association meeting held here recently, Rini

also committed to shipment dates for new releases of existing data base software offerings and gave Cullinane users a glimpse of what new products lie down the road.

(Continued on Page 40)

Performance Monitors Debut

CONYERS, Ga. — Two program performance monitors — an on-line system performance monitor and an OS/VS-1 and MVS disk space management system — make up Altergo Software, Inc.'s latest line of software products called Improve.

Slated for use on IBM 360, 370 and 4300 systems, the Improve family consists of:

- Improve/MON, a program performance monitor that measures CPU activity, I/O activity fetch/load operations and program wait time. The program is also said to reduce program runtime and cut resource utilization.

- Improve/CICS, which monitors performance for the CICS user. The program monitors and reports on CICS activity as well as application program and management routines.

It identifies the areas that will net the highest improvement levels with the least programmer effort and is said to provide more

consistent response times with lower resource utilization. Improve/CICS incorporates Improve/MON.

- Improve/RT, an on-line real-time systems performance monitor that measures CPU utilization, I/O activity at the channel and device level, paging activity, storage utilization and system wait time.

The package provides reports on-line at the operator console or CICS terminal. This is said to give the user an early warning of potential problems, the vendor claimed.

- Improve/DS, for IBM OS/VS-1 and MVS users. The package is a disk space manager that migrates (and restores) seldom-used data sets to tape. Improve/MON costs \$7,000, Improve/CICS (which includes Improve/MON) costs \$10,000, Improve/RT is priced at \$6,000 and Improve/DS costs \$14,000 from Altergo at 1000 Iris Drive, Conyers, Ga. 30207.



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Staff Budgeting System Aids Operations Managers

NEW YORK — Gemini Software Services, Inc. has developed a software package to assist operations managers in preparing annual budgets.

The staff budgeting system uses historical and projected data for calculating forecast budgets and automatically detects missing information while prompting users for missing items.

The package's reporting facility permits selection of reports by individual work units, or it will give the user the

ability to consolidate staffing summaries. Gaming sessions are also available to substitute elements in order to recalculate budgets without modifying the original budget version.

The package is now available on Digital Equipment Corp.'s Decsystem 20.

The package costs between \$8,000 and \$12,000 and requires 128K bytes of memory, the vendor said from 132 West 31 St., New York, N.Y. 10001.

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In-House Viewdata System Commercially Available

By Rex Malik
Special to CW

LONDON — IVS III, the private Viewdata system devised by the Aregon Group and licensed by the British software house Systems Designers, Ltd. (SDL), was on display at the Viewdata 80 exhibition here recently and was discussed in a paper presented by SDL's Viewdata Division manager, Alan R. Haines.

IVS III is the first commercially available private in-house viewdata — videotex — system. SDL's first product in this field, also devised with and for the Aregon Group (formerly known as Inscac), has been bought by General Telephone and Electronics and is being used in its trials.

IVS III is not just the first private Viewdata system offered as a package, it is the only one. ITT's Standard Telephone and Cable (STC) in the UK has developed one for its own internal purposes, but it runs on large mainframes.

Philips System

Philips, which was devising a minicomputer-based private system, has now withdrawn it largely because of software problems, sources said. It may try again when these problems have been solved.

Indications in the industry are that Britain's GEC has now decided not to market the system it has had under development during the last two years.

The IVS III product is based on a Digital Equipment Corp. PDP-11/34 for a 4- to 16-port system or a PDP-11/44 or 11/70 for 16 to 32 ports or more. Between 5,000 and one million frames of information (a frame is a full screen) can be held on a single system, depending on the storage used.

Aregon is currently offering systems with 16 color receivers, storage and software at prices which start around \$130,000 to \$140,000. The system is UK public system-compatible.

U.S. Installation

"Already in the U.S., SDL has installed a Viewdata system connected to the GTE Telenet Communications Corp. X.25 packet-switched network so that a Viewdata terminal can be connected from any major city in the U.S. for the cost of a local telephone call and a low, distance-independent packet charge" — 50 cents for 1,000 packets, the SDL paper noted.

Haines indicated that the system Aregon is offering out of New York comes with an IVS III training course package, a 500-frame business information data base created by Aregon and Fintel, a subsidiary of the UK's Financial Times, and some application packages. It has a built-in in-house electronic mail facility.

The technology seems to be holding up well. A 37-user system already installed reportedly has response times under half a second.

Carleton's Audit Package Has Built-In Data Dictionary

BOSTON — A Cobol-based audit retrieval and analysis system with a built-in data dictionary allows users to create an audit environment that is independent of their organization's DP department.

The hardware-independent software package, Auditec, can be used by auditors on any computer with a Cobol compiler, according to its vendor, Carleton Corp.

The system's data dictionary provides standardized system-generated documentation and isolates all of the user's technical information in one central data structure. This feature is said to significantly reduce the coding involved in report definition and reduce by 60% input error rates.

Sequential, indexed sequential, random and data base files can be accessed by Auditec. Any number of fields or files can be referenced in report definition, the vendor said.

Reports Generated

Both one-time special report requests and production reports that repeat at regular intervals can be generated. Audit reports are said to be defined in the package using common audit terms, while input for report definition can be done either free form or on work sheets provided by the vendor.

Auditec automatically generates confirmations, mailing labels, cross-tabulations, aging reports, statistical distributions, stratifications, exception reports, variance reports, trial balances, file footings and graphs.

A series of automatic reports for auditors delivers functionally predefined solutions for audit tasks that frequently recur during audits, the vendor noted.

These include a statistical report that creates distribution statistics such as occurrence count, total value, percent of total count, percent of total value, mean, standard deviation and minimum and maximum values.

An automatic stratification and aging feature generates a count of occurrences and total value for any number of standard or user-selected age categories.

Sampling Techniques

According to Carleton, Auditec users can choose from a number of sampling techniques — such as random, interval, proportional, attribute, cluster and stop-or-go. Samples may be either simple or stratified.

The vendor said it will provide interfaces to most commercially available data base management systems (DBMS) including Intel Corp.'s System 2000; Cincom System, Inc.'s Total; Cullinane Corp.'s IDMS and Software AG's Adabas.

On IBM systems, Auditec uses 64K bytes of core memory; memory requirements on other systems vary according to the hardware.

License fees start at \$13,500 for a single installation and no DBMS interface. All DBMS interfaces cost \$5,000 from Carleton Corp., 44 Bromfield St., Boston, Mass. 02108.

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For Program Development 'Imszap' Aids IMS/VS Users

GREENBELT, Md. — A program development tool for IBM IMS/VS users is available from United System, Inc.

Called Imszap, the package is said to provide a facility to add, modify, delete or retrieve a segment from any IMS/VS on-line data base defined to the program through Public Status Block Generation (PSBGEN), the vendor said.

The package was designed to alleviate the burden of preparing test data during program development and IMS/VS maintenance. It is also helpful, the vendor said, when nondisplayable characters — such as packed numeric data or binary data — are required for certain fields in the segment.

With Imszap, any type of data can be manipulated from a terminal. In addition, by specifying the function to be performed with search arguments, users can access any segment in the data base, the vendor claimed.

The system was designed according to IBM's IMS program products. All function codes, data base returned status codes and system messages are compatible with the IBM IMS end user.

Load Modules

Imszap consists of two load modules, one for batch processing and one for message processing.

The batch processing module is said to generate macrostatements. These statements will then be assembled and link-edited into the format library to define IBM 3270 terminal screen formats by specifying the transaction name, PSB name, device I/O format, message input format and message output format, the vendor said.

The message processing module interacts with the user to create, retrieve,

modify or delete a data base segment.

By specifying a valid data base function code, the program will allow users to create and modify the contents of any key accessible data base segment. The function of the offset parameter is to allow users to specify the starting position of the data base segment to be displayed, according to the vendor.

Programs in the Imszap package are written in PL/1, but an assembler language version is also available. The package also requires either IMS Version 2 or IMS/VS and either OS/VS1 or OS/VS2, the vendor said.

The package costs \$3,200, \$200/mo on a one-year lease or \$150/mo on a three-year lease from Suite 301, 8007 Mandan Road, Greenbelt, Md. 20770.

'Minicomputer Total' Runs on Prime Gear

CINCINNATI — Cincom Systems, Inc. announced a version of its Minicomputer Total data base management system (DBMS) for users of Prime Computer, Inc. minicomputers.

The DBMS will operate on Prime models 150 through 750, a Cincom spokesman said.

For these systems, Minicomputer Total operates in the central mode, said to permit multiple terminals, users and programs to access the data base simultaneously.

The DBMS also runs with the Primos IV operating system, standard utility set, Cobol, Fortran and most high-level languages, the spokes-

man noted.

Features include both task-level and systemwide recovery capabilities; data independence to allow record layouts, operating system and hardware to be changed without impacting existing application programs; security at all data base levels; and element list binding.

Minicomputer Total for the Prime 150 through 750 licenses for a one-time fee of \$22,000 or can be leased for \$975/mo. Installation costs \$1,500.

The annual usage fee is \$2,640 from Cincom Systems at 2300 Montana Ave., Cincinnati, Ohio 45211.

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Look/4 Fits NCR Users

PLEASANT HILL, Calif. — A management inquiry language for NCR Corp. Criterion 8400 and 8500 systems is available from Century Analysis, Inc.

Called Look/4, the package provides managers and end users with a data base inquiry and reporting tool that allows arithmetic, statistical and comparative analyses of data without the need for programming expertise, the vendor said.

In addition, the package offers interactive report generation for the DP department, the vendor claimed.

Two Subsystems

Look/4 consists of two subsystems, a Report Composition Subsystem, which is a menu-driven report preparation program, and a Report Execution Subsystem, which actually generates the reports.

The package can be used as a stand-alone package, or it can interface with the Plus/4 data base management system, also offered by Century.

Look/4 costs \$5,000 and requires a minimum of 70K bytes of memory. Century Analysis is located at 3343 Vincent Road, Pleasant Hill, Calif. 94523.

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More With 'Less'

MILLBROOK, N.Y. — The Library Extension Support System (Less) and an Acall subroutine for single-port Datapoint Corp. 1800 and 3800 systems are available from Whalen Computer Services, Inc.

Less is said to provide a complete library facility for text files and support for user command libraries. The text library facility allows any data or program file to reside in a library under one file name. Formerly, there had to be a separate name for each file, the vendor said.

With Less, users are no longer restricted to storing only 256 files on a disk. Now, users can place as many files as will fit on the disk, the vendor added.

Less also provides a RUN command to execute commands from within standard Datapoint format libraries.

Less costs \$1,500 and includes RUN, a test library support system, and Libsort, a utility to sort the names in any Datapoint library, the vendor said.

The Acall subroutine, called DS-Quick, executes on Datapoint's Datashare operating system. The package is said to double the speed of background tasks by disabling foreground activity, the vendor said.

DS-Quick costs \$300 and is available on double-density diskette or cassette. Neither Less nor DS-Quick will run on Datapoint 1500 systems, the vendor said from Bennett Complex, Box 347, Millbrook, N.Y. 12545.

RSTS/E ON VAX ROSS/V (RSTS/E Operating System Simulator for VAX)

ROSS/V is a software package, written in VAX-11 MACRO, which provides a RSTS/E monitor environment for programs running in PDP-11 compatibility mode on DEC's VAX-11.

ROSS/V SUPPORTS:

- The BASIC-PLUS interactive environment.
- Concurrent use of multiple run-time systems.
- Update mode (multi-user read/write access to shared files.)
- CCL (Concise Command Language) commands.
- An extensive subset of RSTS/E monitor calls.

ROSS/V runs under VMS and interfaces to programs and run-time systems at the RSTS/E monitor call level. ROSS/V makes it possible for DEC PDP-11 RSTS/E users to move many of their applications directly to the VAX with little or no modification and to continue program development on the VAX in the uniquely hospitable RSTS/E environment. Most BASIC-PLUS programs will run under an unmodified BASIC-PLUS run-time system.

RSTS, PDP-11, VAX-11, and DEC are trademarks of Digital Equipment Corporation.

ROSS/V IS AVAILABLE FROM:

(EASTERN U.S.)	(CENTRAL U.S.)	(WESTERN U.S.)
Evans Griffiths & Hart, Inc. 55 Waltham Street, Lexington, Mass. 02173 (617) 851-0670	Interactive Information Systems, Inc. 10 Knollcrest Drive, Cincinnati, Ohio 45237 (513) 761-0132 or (800) 543-4613 outside Ohio	OnLine Data Processing, Inc. N. 637 Hamilton, Spokane, Washington 99202 (509) 484-3400

Cullinane Delays 'Escape'

(Continued from Page 37)
Under Cullinane's current development schedule, Release 5.7 of IDMS/DB will be available in the second quarter of 1981 and will include a path call facility plus record search arguments.

Carrying the same target delivery date is IDMS/DC Release 2.0, which will offer PL/I applications program support, support for Vsam and enhancements to the mapping system.

Maintenance tapes — containing all program corrections — for the OS version of IDMS/DC are now available, Rini noted, adding tapes for DOS users will be available in Gamma form in early May.

Next year's second quarter will also bring to market Release 3.0 of the vendor's Integrated Data Dictionary (IDD), a version that will provide on-line interactive execution capability, Rini said.

At that time Cullinane also

expects to begin deliveries of the On-line Application Development System (Oads), said to allow users to update data bases and perform maintenance against the data base without having to develop applications programs for these tasks.

Multiple report support and automatic headers will be added to the vendor's On-Line Query in Release 3.0, due out in the fourth quarter of this year.

Intellect Query

In that time frame will also come Release 2.0 of Intellect Query, an end-user English-like language query facility Cullinane acquired recently for \$500,000 from Artificial Intelligence Corp.

This version will run under the IDMS Central Version (CV) and support "most commercially available teleprocessing monitors" including IBM's CICS, Shadow from Altergo Software, Inc., Intercomm from SDA Products, Inc. and Turnkey Systems, Inc.'s Task/Master.

Release 1.0 of Intellect Query will be available in early May, Rini noted, adding this first release will support

T50 and CMS users.

Also due out in the fourth quarter are:

- The first release of the Universal Communications Facility (UCF), that reportedly lets users write and develop applications programs in the CV environment of IDMS/DB and DC.

- The first release of IDS Input, a batch input processor acquired from Multi Systems Corp. that is said to let users update their data bases in a batch mode.

- Release 6.1 of Interact, Cullinane's on-line program development and text-editing system, to include full screen management capabilities and to interface with IDD and Pansophic Systems, Inc.'s Panvalet library.

- Release 6.0 of the Culprit report generator, expected to provide decimal point alignment capabilities. Maintenance tapes for Release 5.0 will be available in May.

Explaining why new releases "may seem a little farther out than you're used to," Rini said Cullinane needed time for adequate in-house and regression testing to cut down on potential technical support problems.

System Fits Library Use

(Continued from Page 37)

Among Soloman's program development capabilities are automatic creation of JCL for remote job submission; editing commands in both IBM and Honeywell formats such as line number, string or column orientation; on-line setting of all compiler and run-time options; copy and save verbs; and verbs that create catalogue/string structures to define a hierarchical path into the Soloman library.

Available directly from ISC or on a referral basis from Honeywell, Soloman licenses for a one-time fee of \$7,300 or for \$325/mo. Customer shipments will begin in May, ISC said from Suite A, 2338 West Royal Palm, Phoenix, Ariz. 85021.

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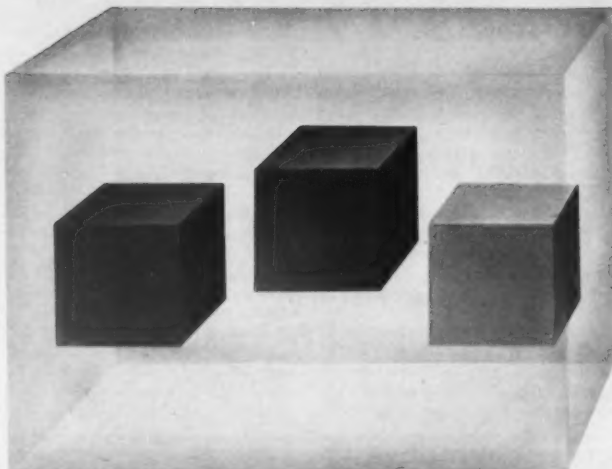
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The Transparent Single System Image Has Arrived!



With the recent addition of the Global Console Director (GCD) to Allen Services' line of software packages for Multiple System environments, an entire complex of systems can now be treated almost as though it were **one single unified system**.

The complete "unified system" effect is achieved through combined use of three independent (but related) program products. Each of these, Super-MSI, MSM and GCD addresses distinct concerns present in multi-system environments.

Of course, since the products are independent, if you aren't yet ready for the full-blown unified system effect, you only need to select the products which interest you.

UNIFIED DATA INTEGRITY (including VSAM)



The Multiple Systems Integrity Facility provides the same thorough dataset integrity protection for jobs in **different** systems that would exist if the jobs were in the **same** system. In addition to propagating "standard" dataset integrity across systems, Super-MSI also insures that the VSAM "internal" SHR options are honored throughout your entire complex. Effective cross-system VSAM integrity can be obtained in no other way than through the use of Super-MSI.

Another feature: Super-MSI also **eliminates the hardware RESERVE lockouts** which are normally inherent with SHARED DASD in multiple system environments.

Much more besides: Super-MSI has many other exciting features including special aids for operators and TSO Users. All in all, Super-MSI will be a very powerful addition to your installation.

UNIFIED DEVICE MANAGEMENT



The Multiple Systems Manager manages the allocation of TAPE and MOUNTABLE DISK devices across all systems in your complex. It allows you to operate normally with **all** devices **ONLINE** to **all** systems. MSM insures that device allocation by jobs in different systems occurs just as if all jobs were operating in one single unified system.

MSM eliminates the operational burden of juggling TAPE and DISK units among systems. It protects against the danger of a system accidentally rewinding or overwriting a TAPE in use on another system; this removes the single greatest cause of shared tape mishaps.

MSM will use your TAPES and DISKS more efficiently — which can result in immediate device cutbacks or (more likely) postponement of future acquisitions.

MSM is so transparent that it can be operated without the use of any new operational commands. Of course, there are powerful new commands available — however these are extras, not necessities.

Only MSM allows such truly NATURAL and transparent shared device management.

Other features (for MVS environments only):

- The MSM Device Prefencing capability allows devices to be dynamically structured into a hierarchy of sets; MSM insures that units in preferred sets are used, wherever possible, before less preferred sets.
- The MSM **SOFTSWAP™** feature insures that DDR device SWAPs for TAPE units will **NOT** impact JOBS or TSO users which are not using tape allocation. Without **SOFTSWAP™**, TAPE DDR SWAPs are likely to impede all allocations in a system — including even those which do not use tape.

UNIFIED OPERATOR CONSOLES



The Global Console Director is an extremely flexible tool. It allows (selected) message streams from different systems to be logically "blended" to create a **unified system image** (to whatever degree desired). In a slightly different vein, GCD allows **any** console on any system to be logically attached concurrently (and perhaps in different ways) to any set of systems in your complex!

GCD allows commands entered from any console to be directed and processed anywhere in the complex; in this respect, all consoles are effectively linked to all systems.

In almost every aspect, GCD is philosophically and operationally compatible with the standard system console support.

GCD can improve overall throughput by simplifying operations. By allowing several physical consoles to be logically merged, excess devices can be eliminated for immediate savings, or deployed elsewhere to strategic advantage.

GCD is absolutely transparent to your users, and aside from major simplifications, nearly transparent to operations.

If you wish to use more than one of the above products, they can be integrated together into a single control task (thus further reducing overhead and complexity).

In nearly every instance where our products have been competitively evaluated against all possible hardware or software alternatives — our software has been chosen. Aside from IBM, Allen Services has been providing commercial software specifically designed for multiple system environments longer than any other company. Over 400 major installations throughout the world have already selected our products as the preferable means of handling problems associated with multiple system environments. The number grows daily. **Reliability** has always been an integral part of our design.

When considering software, most people consider **support** to be a very important factor — Allen Services has over 200 support personnel.

The only other comprehensive approach to unifying multiple systems is JES3 (or ASP). Aside from the fact that MSI/MSM/GCD can be installed and implemented in only a few minutes, there are several other significant differences from JES3: For example, MSI/MSM/GCD (combined) use only 1% to 2% overhead; MSI/MSM/GCD are invisible to your users; MSI/MSM/GCD were designed to be strictly compatible with OS/VS/MVS philosophies — in this regard none of your personnel will require re-training.

The majority of all eligible multiple system installations are now using our products to help manage their systems.

Because installations can have widely different characteristics, you may still have a nagging suspicion that our claims may not actually apply to your shop. To alleviate this doubt, we invite you to try our products (whichever ones interest you) at your own installation under your own conditions. This trial carries no charge and is without obligation. One word of caution: You're going to like them so much, you'll never take them out.



For more information, call Susan: **800-543-7583** (in Ohio: 513-890-1200)
Or write: Software Department • Allen Services Corp.
212 W. National Rd. • Vandalia, Ohio, 45377

Package Cuts Bank Losses in Check Handling

MIAMI — The idea of a bank's losing about \$1 million is tough to swallow, but it happens.

No, such losses don't usually occur because someone left a bag of bills in a dark corner; banks have more subtle ways of losing money — like dawdling in collecting on checks cashed from other banks.

For every \$1 million tied up in uncollected checks, a bank loses about \$278 each day in potential revenue on investments. And that \$278 mounts up when millions of outstanding checks are involved each day, 365 days a year.

The estimated loss on those millions of checks has turned some heads at Southeast Banking Corp. here. And top management is looking to the DP department for the solution.

Dramatic Decrease

In 1977, Southeast Banking lost \$491 million in the uncollected checks game. By 1978 that loss was cut to a mere \$177 million, by using IBM's Check Processing Control System (CPCS) software package.

Although \$177 million is far from a drop in the bucket, the \$314 million reduction in losses had a pleasant ring for bank officials because it boosted bank earnings by 99% in 1978.

The bank piled up a big savings last year, but this year looks even better. The bank didn't lose anything last month and it expects to do as well in April. Those savings come in spite of an increasing check volume which used to cost some \$40 million a month, according to James D. MacLea, senior vice-president of the bank's DP operation.

"We must credit the combined effort of the banks we deal with, our computer operation, some creative programming and a new generation of check-processing equipment that enables us to handle 300,000 items an hour.

"Our three IBM 3890 high-speed document processors represent the keystone of our check-processing structure and are capable of handling three million item passes per day."

The 3890s are used in conjunction with CPCS on the bank's IBM 370/158. The package processes magnetic ink character recognition (Micr) documents, MacLea said.

Since it installed the package, the bank has been able to process checks faster. Now Southeast Banking Corp. meets its processing deadline almost every night, MacLea said.

Processing Procedure

Checks are sorted according to class and distributed to the proof department. Low-speed items are processed directly on multipocket proof/encoders. Unencoded items that can be handled by machine are distributed to single-pocket machines, where deposits are proven and the items encoded.

Encoded and preencoded items are then sent to a control area to be batched for high-speed processing, MacLea said.

Items are run through the 3890 document processors, and those machines communicate with the CPCS package.

CPCS captures data on checks and issues sorting instructions to the 3890s. The items are sorted into four general classifications: transit items, on-us

items, those drawn on Southeast Banks and rejects, the bank said.

Transit items are broken down into bundles in accordance with Federal Reserve sorting requirements. They are then matched with listings produced by CPCS.

Listings and bundles for each end-point are bagged with a cash letter form and readied for dispatch to the Federal Reserve or other collection points.

Rejects are sent to a CRT terminal station, where an operator keys in Micr data that the 3890 could not read. That information is communicated to CPCS to be added to the file of items processed. Physical rejects are sorted on multipocket proof encoders and transit items are sent to cash letter

preparation, while on-us items remain in-house.

On-us items are processed again through the 3890, this time to put them into account-number order. Meanwhile, on-us item data is passed by CPCS to the demand deposit accounting (DDA) update program, which posts debits and credits to customer accounts. Reports from the DDA system, as well as fine-sorted checks, are sent to the bookkeeping department.

'Bread-and-Butter'

Two of the 3890s are full-featured to handle the "bread-and-butter" work, and this is where money is made or lost on performance. If the machines perform properly 99% of the time, South-

east makes enough money to pay for them. "Fortunately," MacLea said, "they haven't let us down and we feel our investment in them has been fully justified."

The other machine is not full-featured, but it is used to share the fine-sorting load — which represents up to 75% of check-processing work — and for certain clean-up tasks.

Work for 23 affiliate or correspondent banks passes through the 3890s. The equipment handles about 200,000 incoming Federal Reserve Bank items (clean, encoded, ready-to-run work or "inclearings" that other banks send through the Fed), 300,000 Fed outgoing items and 170,000 DDA items processed for Southeast and other banks every day.



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Creates Payroll, Personnel System

On-Line 'UFO' Aids, Abets Chicago Police DP

CHICAGO — Wary of creating a payroll and personnel system for a CICS/VS environment, the Chicago Police Department acquired an on-line application development system that reduced costs and development time while boosting productivity 20:1.

Having invested \$4.5 million and the time of 120 people over a three-year period in order to develop its previous payroll and personnel system, the department was pleasantly surprised when, in 1978, UFO by Oxford, Software Corp. enabled six people to create a system in six months for \$160,000.

Before choosing UFO, the department's systems engineer Bob Miller said he considered IBM's Display

Management System (DMS). He had heard DMS could create shortcuts in the development time of on-line systems and realized it would be compatible with the department's twin IBM 370/158s running CICS/VS.

"But I did not like what I saw in DMS because it was batch-oriented with no interactive testing capability, he said, adding that with DMS there are software problems that force technical support groups to change program and file control tables.

After hearing about UFO, Miller talked to some users, received favorable responses and decided to give it a 30-day trial. "It beat anything I had ever seen as far as developing on-line

applications, and it was dirt cheap," he said. "We got the full-blown system for \$20,000."

'UFO' Implementation

Pointing out a weakness, Miller noted UFO's response time is almost double that of CICS/VS because it has to interpret code on a line-by-line basis instead of by executing a load module.

That poses no great problem for the police department's personnel system, he said, because it has a low volume of transactions.

There were some bugs discovered in UFO during implementation. For a while, UFO was bringing down CICS/VS, a situation described as

"embarrassing." The original instruction manuals were also poorly written, he added.

With UFO, Miller said he can create screens and build the application before starting the logic. That means an on-line system created to examine and update files can be up and running within three days.

UFO also defines files on-line without defining them to CICS/VS, thereby eliminating the need to recompile control tables in CICS/VS, a process that may take up to two weeks.

"With UFO, the software people can work independently while I'm developing the application because I have the ability to both define and allocate files on-line," Miller said.

System Links

At the heart of the Chicago Police Department's payroll and personnel system is a system that keeps track of deductions, dependents and changes in employment status.

That basic system is then linked to budgetary line items to help keep the department under sound fiscal control.

The system is linked to historical and other personnel files where all awards, commendations and promotions are recorded for each of the sworn personnel that make up about 83% of all department employees.

In addition, it is hooked into the departmental file connecting each police badge number with its owner. During the development of the payroll and personnel system, the department also had a comprehensive missing persons system with UFO and IBM's Automated Text Management System (ATMS) and the Storage and Information Retrieval System (Stairs).

"We consider the comprehensive payroll and personnel system we have today as our foundation system," Miller said. "Now we can begin to build on it. We want to hook in an entire medical history file to accompany the personnel information already stored."

DP Manager Ronald Manka said there is a great difference in the way users view the DP department since UFO and the payroll and personnel system have been running.

"People who used to hear that their application was complex, that it was going to take several years to develop and cost millions of dollars — now get results right before their eyes with UFO," he said.

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SAVES MAN-HOURS AND TIME

For example, IDC reported Series 80 TOTAL saves man hours two ways. First, it only requires an average of one person spending half his time to support the system. That's one fourth the people required by another leading package which needed four people on average and sometimes as many as 12. Unlike another leading package, Series 80 TOTAL was reported up and running right on schedule, not behind it. And unlike two other major packages, Series 80 TOTAL users were completely satisfied with its fast response time in actual operation.

EASILY ADAPTS TO CHANGE

It stands to reason that the more useful a DBMS is to management, the more they'll use it. According to the IDC survey, users integrated Series 80 TOTAL into an average of 41% of all applications. That's more than any other DBMS and almost twice as much as the next leading system.

That's because with Series 80 TOTAL's powerful data structuring capabilities almost any data relationship can be rapidly and easily defined.

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Many DBMS packages promise to do everything we have just told you Series 80 TOTAL does. But when IDC asked DBMS users how they'd change their present package, Series 80 TOTAL was the only one of the three leading systems to emerge with a clean bill of health.

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"Here are four reasons why we switched to NCR," says Dale A. Dooley of the Iowa Transfer System.

DOOLEY:

The Iowa Transfer System is the first electronic funds transfer system to operate statewide. Over 85 percent of the commercial banks in Iowa are supporting members. We recently installed an NCR 8450 as the central element — the switch — in our network.

NCR's SCHULTE:

It's the element that makes the remote connections, so that every terminal has access to every bank on the network. All across the state of Iowa.

DOOLEY:

Our first reason for going to NCR is monetary. With NCR, our costs are substantially lower than under our previous arrangement.

NCR's SCHULTE:

And at least a bit lower than the other alternatives you explored.

DOOLEY:

Then there is the support we received from NCR and from you, Jim. And NCR's known commitment to EFT.

NCR's SCHULTE:

NCR representatives are specialized. All the people in my group work exclusively with financial institutions. So we are in tune with current financial trends. Other



Dale A. Dooley (left) is executive director of Iowa Transfer System, Inc., in Des Moines. Jim Schulte is NCR district manager.

NCR representatives have parallel specialties so they can be more responsive to the problems peculiar to their industries. It's a concept that is working well for us.

DOOLEY:

The third reason is software. Only NCR could provide the switch software we needed when we had to have it.

NCR's SCHULTE:

Not only did we meet the deadline, but the transition to our system was very smooth.

DOOLEY:

Finally, our decision was influenced by the dependable performance of the other NCR systems within the network. And we have had the same experi-

ence with this system. Our uptime level has been very high — a critical consideration when you're talking about a network switch.

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Using Data Concentrator Service Bureau Cuts Delivery Hassles

By Jay Woodruff
CW Staff

SIOUX FALLS, S.D. — A service bureau here is saving its clients the trouble of taking their data to the shop for batch processing by letting them key it into a data concentrator over phone lines.

Data, Inc. handles batch pro-

cessing for area businesses and organizations. The data can be sent at the clients' convenience and the service bureau does not have to arrange to receive it, according to Mike Cassidy, the firm's systems programmer.

The service bureau primarily offers general ledger and accounts receivable services for

firms as small as a pharmacy or as large as a department store. Small outfits are not required to have their own CRT terminals for data transaction; orders, payroll and other business activities that can be kept in numeric form can be keyed in over a standard Touch-Tone phone, Cassidy said.

The main advantage of the concentrator, which can take input over eight incoming lines simultaneously, is that it is "a real cheap form of data entry," Cassidy explained. "For numeric work, no equipment is necessary on the user's end except for the Touch-Tone phone. If users require alphanumeric data entry, they need to go to a CRT terminal."

The Phone 1, Inc. P1-5 data concentrator, which was installed in 1977, uses two types of modems — one for conversion of Touch-Tone inputs to Ascii code

(Continued on Page 46)

System Multiplexes Up to 31 Lines

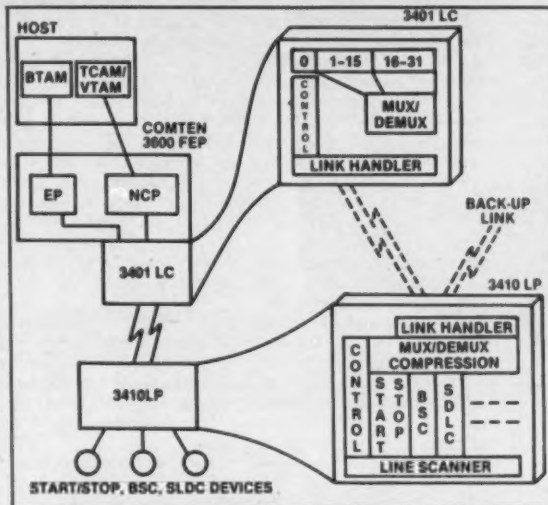
ST. PAUL, Minn.—A link processor system (LPS) that multiplexes up to 31 IBM bisynchronous and Synchronous Data Link Control (SDLC) lines is available from NCR Comten, Inc.

The Model 3400 LPS is completely transparent to terminals and software in an IBM 360, 370, 4300 or 30 series mainframe environment, a Comten spokesman maintained. As a subsystem of Comten's 3600 line of communications processors, the LPS can attach multiple, remotely located terminals and cluster controllers to a 3600 network where the full capabilities of a 3600 are not required, he added.

In a network using the 3400 LPS, the supported terminals appear to be attached directly to the communications processor node. The user can thus implement a network of 3400s without needed elaborate front-end processor software, the spokesman explained.

Terminals attached to a 3400 LPS reportedly have the same functional capabilities — such as site switching, terminal switching and automatic speed detection — as terminals linked directly to Comten's 3650 or 3690 communications processors. The 3400 connections to a 3600 processor employ IBM's SDLC procedures.

The 3400 LPS consists of software, a 3401 link controller and one or more remote adaptive



Comten's EP and NCP software supports the 3400 LPS.

multiplexer devices called the 3410 link processors. The 3401 is located at the 3600 network node and can join up to four link circuits to one or more 3410s. The 3400 LPS software is generated under Comten's network definitions procedure and requires the vendor's 3600 control system software release 62.0 and above.

Up to 31 terminal lines may be distributed among all 3410 link processors connected to a 3401 link controller, the spokesman continued. Up to eight 3410s can

(Continued on Page 46)

Prices Cut By Hazeltine

GREENLAWN, N.Y. — Despite inflation, Hazeltine Corp. has slashed prices on its 1400 and 1500 series CRT terminals by an average of 10%. A number of DP vendors have blamed inflation for recent price increases on their goods and services.

Hazeltine's changes affect the Model 1410 and 1420 "economy terminals as well as the microprocessor-controlled 1500, 1510 and 1520 models. The 1500 now costs \$1,095, a \$130 cut, Hazeltine noted from W. Pulaski Road, Greenlawn, N.Y. 11740.

Sick of a Sick Economy?

Got the stagflation blues?

Are production slowdowns, tight money or other trappings of a recession hurting data communications in your organization? How adequate is your data communications budget as inflation swells the costs of development, maintenance, labor and supplies?

Computerworld welcomes written commentaries and reports on how data communications users are coping — or should be coping — with the distressed economy. Contributed articles must not exceed about five, double-spaced typewritten pages in length. Send your manuscript soon to Brad Schultz at CW, 375 Cochituate Road, Framingham, Mass. 01701.

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Transaction-Oriented Gear Terminals, Printers Among Burroughs Debuts

DETROIT — Burroughs Corp. has broadened its line of transaction-oriented communicating peripherals by introducing a number of CRT terminals, printers and other gear.

The vendor added the MT 300 printer-based validation and receipt terminal, the MT 700 programmable CRT terminal and the MT 900 general-purpose CRT terminal to its BMT microprocessor-based terminal family.

Designed for remote input and processing, operator

prompting and transaction editing, the MT 300 offers either a 4.5- or 5.5-in. wide validation/journal printer, a 44-key numeric key pad and a 40 char./line CRT. Options include a 5- and 9-in. display monitor, a passbook printer, a personal identification number (PIN) keyboard, a magnetic card reader and a micro-cassette.

Aimed at financial institutions, the MT 700 programmable CRT terminal offers a choice of 5-, 9- and 12-in. screens and up to 96,000 bytes

of programmable random-access memory. Burroughs or the user may develop applications programs in the Transaction Programming Language, a compiler now available for \$100.

The MT 900 emulates currently installed Burroughs TD

830 terminals and features a 2,000-char. display screen. Peripheral options include a journal printer.

A basic MT 300 costs \$3,790 or may be leased for one year at \$164/mo. Its optional 5- and 9-in. display monitors cost \$700 and \$1,000, respec-

tively. An MT-700 with 5-in. display and 64,000 bytes of memory costs \$2,625. The programmable terminal may be leased for one year at \$113/mo.

The MT 900 terminal costs \$3,015 and may be leased for one year at \$129/mo.

Service Bureau Improves Service

(Continued from Page 45)
and the other for ordinary CRT communications.

In addition to the routine business processing done here, Data, Inc. uses the concentrator for handling voter registration record-keeping in Minnehaha County.

At the county courthouse, information on voters is keyed into a pair of Digilog Systems, Inc. Microterm ACT-IV-B terminals over phone lines to the service bureau's Phone 1.

Though the Microterm terminal is programmable, Data, Inc. does not use its intelligent capabilities, preferring instead to leave all logic, including formatting and editing, to the concentrator. Even data that is being keyed is not stored in the terminal buffer before transmission. Instead, the concentrator mirrors back the information typed into the terminal as each character is sent to it so that it will appear on the CRT.

All data first goes into the P1-5's line buffer. Every time the sender hits the return key, data is transferred to a pair of I/O buffers. Generalized software in the concentrator divides data into 10-char. fields when it is transferred to a pair of 22K-byte diskettes, which are then physically carried to an IBM 360/50 for processing.

To use the courthouse registration system, a clerk types all the required registration information into the terminal. After collection in the concentrator, the data is processed on the IBM CPU to produce a

book of registered voters for distribution to all the polling places in the county.

The information is also used to provide political parties and other organizations with specialized lists of voters — for example a list of all Democrats in a certain precinct. The county also keeps a 10-year history of the number of times each person registered and voted. After the election, the county uses the terminals to update its records.

Payables, Inventory

Though general ledger and accounts receivable make up the bulk of Data, Inc.'s business, it can also handle accounts payable inventory work.

"For a local electronics firm, we do reports on how long it takes for each worker to produce each component and the number of units produced. Such information is gathered over Touch-Tone phones to be produced in batch on

worker productivity," he continued.

Service on the concentrator has been good, Cassidy said. His background in electronics allows him to make some repairs himself, to such equipment as diskette drives, but Phone 1 is ready to fly out to Sioux Falls if there is an emergency.

When the concentrator is down and needs to be replaced, the part or unit assembly can be sent by courier service. Otherwise, shipment is by United Parcel Service, he said.

The concentrator will soon be replaced by the latest version of the P1-5, which incorporates both modems, concentrator and diskettes in a single package. The components are now separated. This consolidation should improve servicing, Cassidy said, because he can merely return the entire unit and at the same time be sent a replacement model as rapidly as it is needed.

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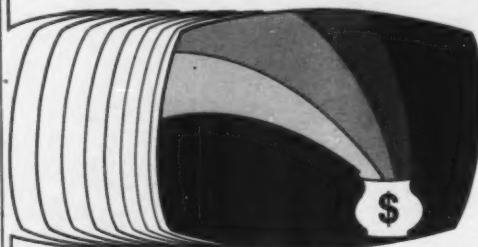
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System Takes 31 Lines

(Continued from Page 45)
be attached to a single 3401 — four directly and four cascaded by one level. The 3400 LPS supports speed between 3401s and 3410s as fast as 19.2K bit/sec; and speeds up to 9,600 bit/sec for start/stop, bisynchronous and SDLC terminal lines.

To drive seven terminals, the 3400 LPS costs about \$631 with a \$75 software charge for each link. There is also a two-year charge of \$274 per line.

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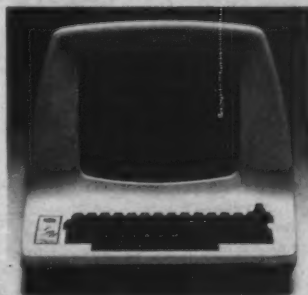
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Lessor Claims Fast Shipment

BOSTON — If you need an IBM 3101 CRT terminal fast, the American Terminal Leasing Co. (ATL) claims it can ship one the same day you order it.

Rates are as low as \$59/mo over a three-year term, according to ATL, and the user can switch to another terminal model at that unit's current lease rate and still complete the lease agreement at the previously agreed upon time, ATL said from 712 Beacon St., Boston, Mass. 02215.

Meet to Cover PBX Future

NEW YORK — A two-day seminar on upcoming applications of private branch exchanges (PBX) in integrated

CHICAGO — Muck spreading just isn't what it used to be. International Mineral and Chemical Corp. (IMC), a fertilizer supplier here, is making its manure go a long way and keeping track of it with the help of portable terminals.

For three years, IMC's Fertilizer Group has used Texas Instruments, Inc. Model 745 terminals to organize information on the manure it ships in more than 5,000 freight cars, which

data/voice communications environments will be held here June 10-11 by Probe Research, Inc.

"The New PBX Applications and User Needs" will feature presentations by major PBX users with extensive DP backgrounds, a Probe spokeswoman said. The seminar will also feature speakers representing a number of the vendors expected to dominate the integrated PBX arena. These include IBM, Northern Telecom Systems Corp., Datapoint Corp., Rolm Corp., Xerox Corp., RCA Corp., Nippon Electric Co. and Jeumont Schneider, a leading French supplier.

Among the user firms whose representatives will address the gathering are Belgium's Janssen Pharmaceutica, a large IBM 3750 installation, and Equitable Life Assurance Co., which employs the data/voice ADX system from Northern Telecom, Inc.'s Danray Division.

Registration for the seminar at the Marriott Essex House Hotel, near New York's Central Park, costs \$595. Further information is available from Rita Tannanbaum at Probe Research, P.O. 251, Milburn, N.J. 07041.

Comet Given Telex Access

CAMBRIDGE, Mass. — Computer Corp. of America (CCA) can now tie its Comet message-switching users into the Telex International message-switching services so they can directly transmit their messages.

The service is said to provide immediate access to more than two million Telex stations in more than 200 countries. Any Comet user can now dial any Telex mailbox number and be connected to it for an additional 30 cents per message, according to a spokesman, but high volume users are likely to benefit most.

In another development, CCA gave Comet users two more hours a week of connect time for their monthly fee of \$60. The fee now covers nine hours of connect time instead of seven and the savings of approximately \$2/hour came as a result of switching from Digital Equipment Corp. PDP-11/40s to more efficient PDP-11/70s, the vendor added.

CCA also announced plans to introduce a Comet system next year that will run on IBM 370, 30 series and 4300 mainframes or their counterparts. It reportedly integrates "generalized data base functionality" with electronic mail, CCA said from 575 Technology Square, Cambridge, Mass. 02139.

Terminals Keep Track of Manure

the company either owns or leases.

From railroad freight offices, 80 of the terminals communicate at 300 bit/sec with IMC's two interconnected IBM mainframes, a 4M-byte 370/158 and a 6M-byte 3031, both under CICS/VS.

"Because of the complexity of our sales and shipping information, a premium is placed on constant information exchange," according to "Kip" Williams, vice-president of fertilizer sales.

The terminals provide up-to-date information on the whereabouts, projected delivery date and other informa-

tion requested on any given order, he said.

According to Williams, the terminals have cut expenses for IMC salesmen and have handled an increased work load without increasing the work force.

The terminals are the size of a hairdryer and run from a customer's office or the salesman's base. To receive a printout on the terminal, the user has to plug it into an electrical outlet and place a standard telephone receiver into the built-in acoustic coupler.

PE Users Gain Controllers

ANAHEIM, Calif. — Perkin-Elmer Corp. (PE) computer users can reportedly save money and space with a synchronous communications line controller and a line printer controller from Macrolink, Inc.

The Programmable Synchronous Dual Line Adapter (PSDLA) offers two channels on a half board, as compared with PE's one-channel SSA adapter, which is built on a whole board, Macrolink said.

The PSDLA offers CCITT V.35 and RS-232C interfaces to PE CPUs and accommodates bisynchronous protocols such as 2780, 3780 and Hasp. It further adds zero bit insertion deletion required for bit-oriented protocols such as Synchronous Data Link Control and High-Level Data Link Control, ac-

cording to the vendor.

The adapter operates at up to 2M bit/sec in half- or full-duplex modes and features programmable modem control. On-line testing is provided through a loopback mode. Cost is \$1,200.

The controller accommodates printing speeds up to 3,700 line/min, or 500K byte/sec, and is reportedly software-compatible with PE's OS/16, OS/32 and host-supplied diagnostics. It can be plugged directly into any available I/O slot in either 16-bit or 32-bit CPUs.

Device address, printer type and special functions are switching selectable on the controller, which costs \$650. Macrolink is at 1740-E S. Anaheim Blvd., Anaheim, Calif. 92805.

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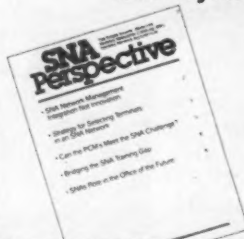
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International Minerals & Chemical Corporation's Fertilizer Group uses TI's Silent 700* Model 745 Portable Data Terminal to conduct their daily shipping and customer service coordination while reducing communications costs.

Railroad station agents rely on the 13-pound portable data terminal to gather shipping information from IMC's host computer. With a push of a button, the Model 745's speedy 30 characters-per-second thermal printer supplies agents with up-to-date printouts of railcar status and freight destinations. And the reliable 745 proves its versatility during the fall and spring when planting and harvesting require efficient, up-to-the-minute scheduling.

IMC's sales force finds the portable 745 to be the ideal traveling companion. Using the data terminal's built-in acoustic



Model 745

coupler connected to a standard telephone, sales agents assemble data the night before a sales call. Or, in some cases, right in the customer's office. The responsive 745 provides IMC sales representatives with instant order status, customer credit history and accounts receivable information. And, with the 745's easy-to-use typewriter-like keyboard, they can access data seven days a week. By adding the virtually silent 745 to their sales force, IMC has cut down on communications costs by approximately 60 percent.

TI is dedicated to producing quality, innovative products like the Model 745 Portable Data Terminal. And TI's hundreds of thousands of data terminals shipped worldwide are backed by the technology and reliability

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If you would like more information on the Model 745 Portable Data Terminal, contact the TI sales office nearest you, or write Texas Instruments

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MPU-Based Controller Unveiled

FALLS CHURCH, Va. — A microcomputer-based modular-design terminal and line controller has been introduced for use in single- and clustered data control and/or computer I/O applications.

The Micromite 403 is offered by the Pulsecom Division of Harvey Hubbell, Inc. It can be

Cybertek Offers Electronic Mail For IBM Users

CULVER CITY, Calif. — An electronic mail system for IBM mainframe users is available from Cybertek Computer Products, Inc.

The average cost of sending a letter is about \$5.60, Cybertek said, claiming that its Cybergram system can cut that cost by 25% to 50%.

The system features CRTs for creating, sending and receiving letters, memos and bulletins. A network manager can assign routing codes to each message, Cybertek added.

Under all versions of IBM's OS/VS, DOS/VS or DOS/VSE operating systems, the Cybergram runs on any IBM 360, 370, 4300 or 30 series mainframe and is compatible with MVS.

The Cybergram sells for between \$24,000 and \$34,000. Lease terms are available, Cybertek noted from 6133 Bristol Parkway, Culver City, Calif. 90230.

Controller Links IBM Terminals To Van Hosts

LOS ALTOS, Calif. — A microprocessor-controlled communications protocol converter that links remote, bi-synchronous IBM 2780 and 3780 terminals to host processors via value-added networks (Van) is available from Intelligent Terminals, Inc.

Able to statistically multiplex low-speed terminals into a high-speed Van, the \$7,200 Adcap Bavi is designed to save the large network user money by reducing transmission errors, eliminating host overhead and spotting line problems.

Intelligent Terminals is located at One First St., Los Altos, Calif. 94022.

ordered with from 16K bytes to 65K bytes of addressable memory and has software-selectable data rates of up to 19.2K bit/sec, or up to 550K bit/sec with an internal clock.

The controller is compatible with most industry-standard asynchronous or synchronous host software packages, and it includes EIA connectors for interface connections of up to four send and receive terminals or lines, Pulsecom said.

Software packages include

Data Station Control, Control Level Translation, Data Speed Conversion and Protocol Conversion. Software is priced separately from the Micromite 403's base price of \$1,700. Each port costs \$100. An extended random-access memory and read-only memory card that gives a total of up to 65K bytes of memory costs \$450.

The Model 403 is also available for rack mounting, Pulsecom said from 5714 Columbia Pike, Falls Church, Va. 22041.

Tel-Tex Terminals Emulate Burroughs Gear

HOUSTON — Users of Tel-Tex, Inc.'s Adds Regent 40 CRT and printer terminals can order them to emulate Burroughs Corp. TD800 CRT and Serial Ascii printer terminals.

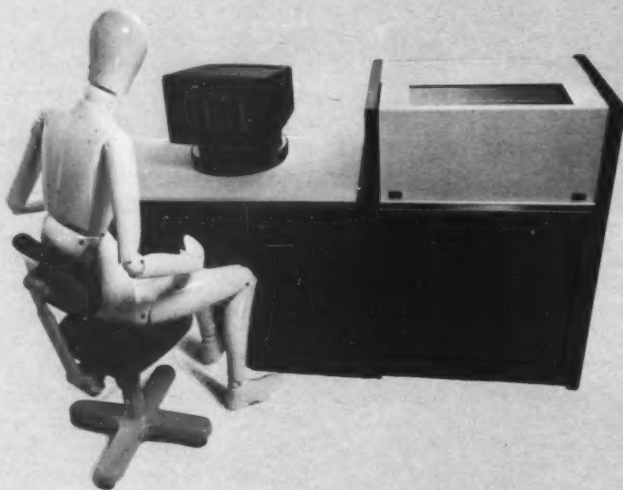
Emulation of the Burroughs equipment is provided by Tel-Tex with the addition of a built-in interface card for the Adds Regent 40, which changes the CRT terminal's

model designation to 40/B.

An Adds Regent 40/B costs \$3,120. Tel-Tex is at 2825 W. 11 St., Houston, Texas 77008.

Clarification

"All About Modems," the Datapro Research Corp. report discussed in this section last week [CW, April 21], is available for \$15 from the company at 1805 Underwood Blvd., Delran, N.J. 08075.



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Meets Set on Packet Nets, Protocols, Security

NEW YORK — Data Communications will host a number of conferences related to packet networks, protocols and network security during the next couple of months.

On May 12-13, the magazine will offer "Data Communications Architecture, Interfaces and Protocols" in Arlington, Va., conducted by Harold C. Folts, who has helped develop a number of remote processing standards.

This conference will cover the standards-making process, describe models of communications architectures and discuss both character-oriented and bit-oriented link control protocols. Folts will also address several applications of public data network interfaces.

On May 19-20, Peggy M. Karp, product engineering director of GTE Telenet Communications Corp., and

Donald F. Weir, that firm's research and planning director, will lecture on the X.25 international standard for packet networks. This San Francisco conference will include an overview of packet-switching technology.

Corporatwide Nets

On June 2-3, Dr. Howard Frank, president of Network Analysis Corp., will direct discussions of "Corporatwide

Packet-Switched Data Networks" in New York City. The program will include tips on designing a corporate data network and an evaluation of current and proposed packet network offerings.

A fourth Data Communications conference is planned for June 9-10 in Boston on the subject of distributed data bases. Prof. Mary Loomis of the University of Arizona (Tucson) will speak on data base

architectures, ways of allocating distributed data base components, security aspects, data base administration and other subjects.

Security Issues

Finally, Hal B. Becker of Advanced Computer Techniques Corp. will discuss data networks security in New York on June 24-25. Becker's conference is aimed at "higher level information systems managers."

Registration for the Folts, Karp and Weir and Frank conferences is \$425, \$475 and \$450, respectively. Registration for the Loomis and Becker meetings is \$450.

More information is available from McGraw-Hill Conference & Exposition Center, 1221 Ave. of the Americas, Room 3677, New York, N.Y. 10020.

Terminal Reads Coded Badges

NORWELL, Mass. — An electronic badge-reading terminal that communicates by means of a twisted wire pair at 300 bit/sec or 1,200 bit/sec has been introduced by Interlock Security Systems Corp.

The \$1,495 Micro-Terminal reads a coded number embedded in the user's plastic card and transmits it asynchronously to any minicomputer, microprocessor mainframe. The CPU responds with a "Yes," "No" or "Interference" reply. The "Yes" reply triggers a relay device that can open a door or perform any other function. A "No" response activates a red LED, while an "Interference" response — indicating transmission problems, improperly inserted cards and the like — activates a yellow LED.

Interlock is located at 44 Till Rock Lane, Norwell, Mass. 02061.

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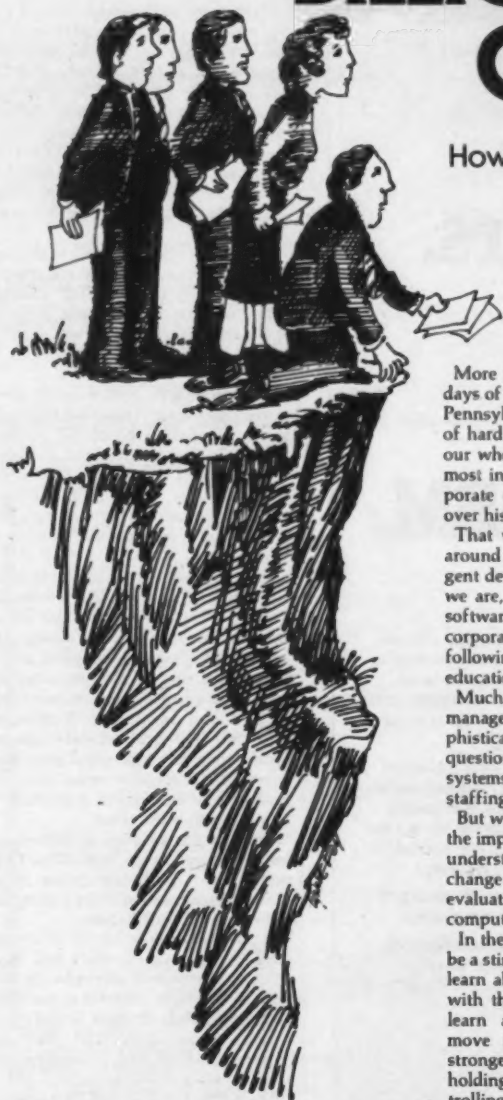
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THE BILLION-DOLLAR CHASM

How educational differences continue to force corporate and data processing executives apart



More than three decades have passed since the days of the Harvard Mark I and the University of Pennsylvania Eniac and, still, enormous growth of hardware systems and their central impact on our whole society boggles the minds of even the most informed technocrats. Never mind the corporate executive struggling to maintain control over his business.

That we have entered a fifth generation built around a proliferation of minicomputers, intelligent devices and information appliances and that we are, perhaps, nearing a fourth generation of software probably is of no more significance to corporate executives now than it was when the following study of corporate and DP executive education was first published three years ago.

Much has been written in those three years, and management, if it hasn't acquired technical sophistication, seems at least to have grown to ask questions about the probable effects of computer systems on productivity, expense controls and staffing.

But whether top executives honestly understand the impact and their influence on it, whether they understand the effects of computer-brought change on their staffs or whether they can really evaluate the real and planned contributions of computers to their businesses is still questionable.

In the insurance industry at least, there seems to be a stirring of interest on the part of executives to learn about computers and to get more involved with them. There seems to be more pressure to learn as younger, better-trained businessmen move into executive ranks. Whether it is a stronger spirit of competitiveness, a matter of holding one's own or a genuine interest in controlling a new tool is a matter for conjecture and debate.

As the realities of the Employment Retirement Income Security Act and its guarantees of mobility begin to settle in, there is a movement that will continue through the 1980s to improve the selection and training of executives of all types. It is now realistic to expect companies to be into success and manpower planning, employee counseling and career development — each geared to re-

(Continued on In Depth/2)

By Robert S. Hoberman

IN DEPTH

(Continued from In Depth/1)

taining quality executives with a firm and to improving their effectiveness and potential value to the organization.

In this context, companies are beginning to examine the need for quality communications. In trying to streamline reporting structures and the quality and speed of decision-making, a few have begun to provide their executives with computer concepts courses that produce at least basic knowledge

and the means to intelligently question what computer applications are being designed and who has the last word on what is done.

Laying a Groundwork

At the same time, the thrust towards general management development, in at least some limited cases, has included DP executives. If, according to the Chinese philosopher Lao-Tse, "Every journey begins with a single step," then at least the groundwork is being

laid to cross the wide chasm that has traditionally existed between corporate and DP executives.

However, some of the old concerns that led to doubt and suspicion appear to remain. User managers still grumble about over-all DP performance. They are still frequently puzzled by the habitual manner in which DP projects miss deadlines; in other parts of the company, this might be grounds for an employee's dismissal.

There is still an attitude that DP peo-

ple tend to be irresponsible, freewheeling and out of synchronization with the rest of the company. This attitude is probably further fostered by the fact that more than half of all companies still are organized so that the DP department reports to the chief financial officer, as it did when the earliest applications were in accounting and administrative functions.

This remains true even though the heaviest influence and payback of DP long since has moved out of these areas and into supporting business operations and cash flows.

Having the DP manager continue to report to the chief financial officer fosters a blockage not only in communications but also in growth. The DP manager, by profile, is a technician who has acquired people skills and some concepts of the company's business objectives. But rarely does he have the education and experience to satisfy, much less succeed, the financial executive or the operations manager.

The study done three years ago showed that only 35% of the companies had ever moved a DP manager into corporate management. I doubt that figure has changed at all.

People Problems

Many problems in the use of computers are, in fact, not machine problems, but people problems centered around failures to communicate objectives and to understand and carry out responsibilities. These problems have caused computers to become as much a frustration to management as a useful tool.

Corporate executives, expert in their areas but naive to or disinterested in specific DP efforts, have trouble defining what they want. They often defer key judgments on the design of information systems to DP professionals who usually lack business training, experience and perspective. Results include the DP professional's use of comfortable techniques that may alter what the user actually needed and, collectively, produce gross inefficiencies in a company's DP effort.

Much of this problem is fostered by limited education on both sides. Corporate and DP groups appear to be growing apart rather than coming to some point of conciliation.

For the 25 years or so the computer industry has existed, there has been great concern about surrendering certain management controls to computers, coping with changes in staff and organizational structures resulting from automation and controlling the spiraling costs of information.

Companies, pushed hard by manufacturers and software vendors, now regard scientific management and automated management information systems as essential to the success of their businesses. Yet the implementation of most of these systems, regardless of the size or wealth of the companies for which they are being built, will fail before it begins.

(Continued on In Depth/4)

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In Depth/4

IN DEPTH

(Continued from In Depth/2)

Since the 1970s, few businesses except for some small, owner-run firms, have existed outside the direct influence of computers. Most medium- and large-sized companies have their own computers. Many supplement their DP capabilities by using the facilities of service bureaus. Yet, because of ineffective organizational and communications structures which often result in competition and misunderstandings between corporate and DP staffs, there are numerous cases where brilliant DP people link up with brilliant businessmen to produce streams of meaningless detail.

It is accepted in many companies that computer systems are not expected to be finished by their original deadlines

or within their original cost estimates. The perspective of what constitutes a deadline is different. To the corporate executive, it is the date on which he ex-

pects the report. To the DP executive, it is "x" days after he has received the final input needed for the system.

And, even where deadlines are not at issue, many computer systems produce long and complex reports which some corporate executives study to cull what meaningful information they can. More often they are confused by detail and the intended purpose of the reports, many of which go largely unused.

Enormous Investment

Shipments of computers during 1975 were estimated by the U.S. Department of Commerce to be valued at about \$11 billion.¹ Network information services — including leasing operations, used computer sales, time-sharing, software support and education and security services — were expected to exceed \$7 billion.² At the same time, the number of installed computers was expected to rise to about 93,000 and the number of computer terminals installed in industry was expected to jump to 1.25 million.³

Studies by Fritz Machlup of Princeton University in 1958, and by Fortune magazine in 1963, showed that the percentage of the U.S. Gross National Product spent on knowledge had risen from 30% to 43% in that five-year period.⁴ There appear to have been no formal studies since that time, but it is obvious that the investment in information and information technology is staggering.

Despite the magnitude of the investment and a failure rate of as much as 40% attributed to computer installations in business and industry, there appears to have been little management thought directed toward optimizing investments in knowledge. Narrow views by top-level executives and DP professionals alike and lack of understanding of the sweeping impact computers have on business suggest there are significant flaws in the education and communications ability of both groups.

Aims of Study

The study was aimed at determining how the education of corporate and DP executives contributes to the waste of time and money and the failure associated with computers to produce useful information in line with immediate goals or corporate objectives.

It may be said with reasonable certainty that:

1. Corporate and DP goals are often separately identified and not in alignment.

2. Top managers often lack either the interest or the perspective to positively influence the use of computers in their companies.

3. The limited education provided to corporate executives too often is oriented towards teaching them how to program a computer rather than how to apply its use to their business.

4. DP people attach loyalties to a closed circle within their own "industry" rather than to the company or industry in which their employers are engaged.

5. Mutual understanding between DP and corporate executives is limited by the vague and suspicious image each has of the other.

In the study, which included an extensive literature review as well as original research, 494 corporate and DP executives were contacted. They represented 462 companies, nearly all listed in the Fortune Double 500 Directory. Of the sample, 267 were corporate executives and 227 were DP executives.

A total of 179 (36.2%) persons returned questionnaires or sent letters. The response by industry and sizes of companies represented by the respondents are provided in Figures 1 through 4.

The average company responding to the study, according to data supplied by the participants, probably had a DP staff of 270 persons, average equipment rental charges of more than \$200,000 per month and an annual DP budget of more than \$6 million. These figures are conservative and do not include participants from very large companies who did not supply data relating to the sizes of their installations.

Figures from the Bureau of Labor Statistics of the U.S. Department of Labor set the nonagricultural work force of the U.S. at 78,817,000 in 1976⁵ and projections carry it to 107.7 million in 1985.⁶ Of this work force, the 1976 Fortune 500 industrial companies employed 14,412,992; 6,481,693 more were employed by the group consisting of the 50 largest commercial banks, life insurance companies, financial companies, retail companies transportation companies and utilities. In addition, figures for the Fortune second 500 industrials show they employed 1,860,002.⁷

Thus, the companies from which the

Company Type	Corporate Executives			D.P. Executives			Total		
	Mailed	Received	%	Mailed	Received	%	Mailed	Received	%
Industrial	199	64	32.1	173	55	31.8	372	119	32.0
Banking	10	4	40.0	9	5	55.6	19	9	47.4
Insurance	10	6	60.0	12	6	50.0	22	12	54.5
Financial	10	2	20.0	6	3	50.0	16	5	31.3
Retailing	10	4	40.0	8	3	37.5	18	7	38.9
Transportation	10	8	80.0	8	4	50.0	18	12	66.7
Utility	10	6	60.0	11	5	45.5	21	11	52.4
Consultant	8	4	50.0	—	—	—	8	4	50.0
Total	267	98	36.7	227	81	35.7	494	179	36.2

Figure 1. Questionnaire Response by Industry

Company Type	<100	100-300	300-500	500-1000	>1000
Industrial	51.4%	24.8%	10.9%	03.8%	04.8%
Banking	00.0	44.4	33.3	22.2	00.0
Insurance	25.0	25.0	16.7	25.0	00.0
Financial	50.0	25.0	00.0	00.0	25.0
Retailing	50.0	50.0	00.0	00.0	00.0
Transportation	58.3	16.7	00.0	25.0	00.0
Utility	00.0	36.4	36.4	09.1	09.1
Consultant	25.0	25.0	00.0	25.0	25.0
Composite	42.9%	27.0%	12.3%	08.6%	04.9%

Figure 2. Response by Size of DP Staff

Company type	50	50-100	100-200	200-300	300-400	400-500	>500
Industrial	38.1%	22.9%	13.9%	06.7%	03.0%	01.9%	09.9%
Banking	00.0	00.0	22.2	22.2	11.1	11.1	33.3
Insurance	00.3	00.3	08.3	16.7	00.0	16.7	16.7
Financial	25.0	25.0	00.0	00.0	00.0	00.0	25.0
Retailing	33.3	30.0	00.0	00.0	00.0	00.0	00.0
Transportation	25.0	16.7	16.7	08.3	08.3	00.0	25.0
Utility	00.0	00.0	36.4	18.2	27.3	00.0	00.1
Consultant	00.0	25.0	00.0	00.0	00.0	25.0	25.0
Composite	28.8%	19.6%	14.1%	08.6%	05.5%	03.7%	12.9%

Figure 3. Response by Monthly Equipment Rental (in \$thousands)

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IN DEPTH

sample for this study was drawn represented about 28.9% of the estimated nonagricultural work force of the U.S.

Accordingly, using data from a 1975 study by Hitchcock Publishing Co. the DP work force of the U.S. at the time of the study was about 1.3 million, of whom 385,004 then probably were employed by the company groups represented in this study. Figure 5 shows the author's calculations based on data from the Hitchcock study and the Fortune figures.

The author's estimate of 1.3 million DP employees compares reasonably to a 1973 study by the American Federation of Information Processing Societies which showed an approximate DP work force of one million⁴. These calculations did not take into account the recession and the effects of unemployment since there were no figures available on the size of layoffs in the DP field. They were assumed to be of a similar or lesser proportion than layoffs of the general work force.

Industrial companies in the Fortune 1,000 would comprise 63.4% of the DP work force employed by the company groups represented in this study. The study group was weighted heavily to industrial companies (75.3%) and, of the questionnaire returns, 66.5% came from industrial companies. Returns from the six other study group industries ranged from 2.8% to 6.7% of the total, since they employ from 2.7% to 10.9% of the DP work force, the sample appears reasonably representative of the industry. Figure 6 shows the details.

Analysis of Results

Because the industrial companies were so significant to both the DP field and this study, it seemed particularly relevant to show a comparison between one form of results obtained from this study and similar results obtained in a Booz-Allen & Hamilton study in the late 1960s which showed the median expense for computer equipment by 108 manufacturing companies to be \$5,600 per \$1 million of sales.¹⁰

A sample of 29 companies, ranging in size from \$100 million to \$3 billion, was drawn randomly from a list of industrials that responded to the study. These companies had 1974 annual sales totaling better than \$30 billion

Company type	Estimated D.P. Staff	% of Total D.P. Staff	% Returns of Questionnaires
Industrial	258,299	64.4	65.3
Banking	12,369	3.1	5.0
Insurance	41,935	10.4	6.7
Financial	10,893	2.7	2.7
Retailing	29,772	7.4	3.9
Transportation	10,111	2.5	6.7
Utilities	38,373	9.5	6.1
Total	401,752		

Figure 6. Relationship Between Questionnaire Response and Estimated Percentage of DP Work Force Employed

Company type	<2	2-4	4-6	6-8	8-10	10-12	12-16	>16
Industrial	40.0%	18.1%	12.4%	05.7%	03.8%	03.8%	02.0%	09.5%
Banking	00.0	00.0	22.2	33.3	00.0	00.0	11.1	33.3
Insurance	06.3	25.0	08.3	00.0	00.0	16.7	08.3	16.7
Financial	50.0	25.0	00.0	00.0	00.0	00.0	00.0	25.0
Retailing	33.3	33.3	16.7	00.0	00.0	00.0	00.0	00.0
Transportation	41.7	25.0	00.0	08.3	00.0	00.0	08.3	16.7
Utility	00.0	18.2	18.2	00.0	27.3	00.0	09.1	18.2
Consultant	00.0	00.0	00.0	25.0	25.0	00.0	00.0	25.0
Composite	31.9%	18.4%	11.7%	06.7%	04.9%	03.7%	03.7%	12.9%

Figure 4. Response by Annual Budget (in \$ millions)

Company type	Total # ¹ Employees	% D.P. to ² Total Staff	Probable D.P. Staff	% Profile of Probable D.P. Staff
Top 500 Industrial	14,412,992	@ .015	216,195	56.2
2nd 500 Industrial	1,860,002	@ .015	27,900	7.2
Banking	458,597	@ .027	12,382	3.2
Insurance	421,961	@ .099	41,774	10.9
Financial	381,779	@ .027	10,308	2.7
Retailing	2,652,959	@ .011	29,183	7.6
Transportation	980,401	@ .011	10,784	2.8
Utilities	1,585,996	@ .023	36,478	9.5
Total	22,754,687	@ .169	385,004	100.1
(Total non-Agricultural U.S. Work Force)	78,817,000	@ .169	1,332,007	(Total U.S. D.P. Work Force)

Figure 5. Author's Calculations of Probable Relative Sizes of DP Staffs (by Industry)

and had approximate 1974 annual DP expenditures of about \$176 million. Their median expense, then, for DP had inched up in the last 10 years to about \$5,900 per \$1 million of sales.

This appears to track with Booz-Allen's finding that computer investments were rising steadily from 4% of total investment in plant and equipment in 1961 to 10% in 1968. In addition, John Diebold suggested in 1970 that the percentage of computer investments might reach 12% by the mid-'70s.¹¹ And this for an industry that employed less than 2% of the total U.S. work force!

Element of Confusion

Despite the enormity of the expense, the study showed there is confusion over how much impact computers actually have on corporate executive's

decisions. While corporate executives say computer reports have a limited use in daily decision-making, DP executives perceive the use as very high. And, while both corporate and DP executives agree that their companies have improved significantly since the

advent of computers, sizable groups on both sides find the efforts inconsistent.

Forty-five percent of the DP executives say corporate executives have minimal-to-poor knowledge of DP; (Continued on In Depth/8)

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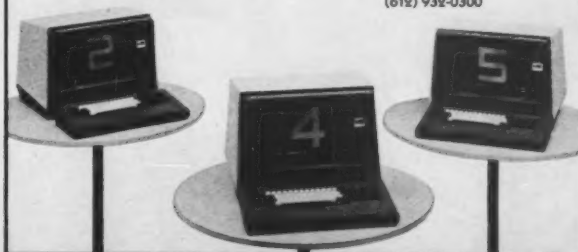
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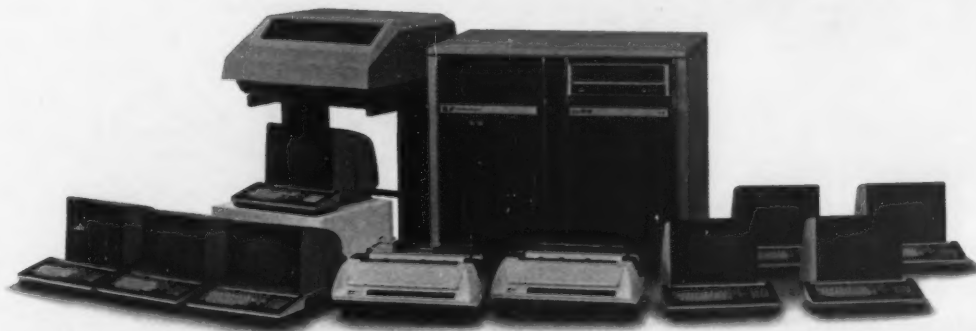
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IN DEPTH

(Continued from In Depth/5)

10% more say they find corporate executives disinterested in DP; another 35% say that corporate executives either delegate the control of systems development projects or remain out of the picture entirely.

Thirty percent of the corporate executives agreed with this despite the warnings of consultants like Withington, Diebold, Brandon, Wight and others that computers represent major investments that ought to be closely managed by top management.

W. Blake Thompson, senior vice-president of financial planning at Allegheny Airlines (now USAir, Inc.), offered this comment in the study: "A close control must be maintained over the DP organization and a complete cost vs. benefit analysis must be made of major applications. In general, an aggressive manufacturer sells unneeded equipment to willing buyers (DP managers) unless the top management of a company is in a position to understand what it is being told. In addition, inefficient operations are paved over with excessive manpower and equipment."

Joseph Orlicky, IBM's leading consultant to the manufacturing industry, has said that "top business executives are willing to spend money but not their time to improve the system efforts of their companies."

The question is, "Why?"

In some cases, corporate executives probably still are awed by the technology and jargon of DP; in others, top executives simply find computer systems too complex and frustrating. They prefer to stick with areas they know well rather than show ignorance or weakness by getting into discussions of computer applications.

Yet one-third of the corporate executives who responded to this study said they are not satisfied with the quantity of information they get and 25% more said they are not satisfied with the quality. On top of this, only slightly more than half said the costs of developing new computer systems were consistently within budget.

If their attitude is so confused and they are so unwilling to get involved with an activity that may represent 12% of their companies' investments, one must question whether they would be similarly uninvolved in the building of a new plant or in the marketing of a new product whose overall annual cost may be far less.

No small part of the problem rests with DP executives. According to this study, more than 80% of them think corporate executives are pleased with quality and quantity and nearly 95% of them apparently feel that corporate executives are well satisfied with the DP organization, generally. They also seem to think that corporate executives think costs are consistently under control.

The president of a large Fortune 500 company summarized his feelings about questions of quantity in computer reports by writing across the

questionnaire, "Too much junk!"

The manager of DP standards, controls and training at a major oil company said, "Most users are reasonably satisfied — but only because they don't appreciate how much better they could do."

The director of information services for another large industrial firm said, "Data processing is OK. However, many systems demand or provide excessive information to the manual action areas."

While DP executives say they would like corporate executives to play a much larger role in systems development, they also suggest that corporate executives don't know enough about DP to contribute very much.

The DP manager of a manufacturing company commented in this survey that, "Management is unknowledgeable and not interested enough to become more knowledgeable."

Another DP executive, from a much larger manufacturer, commented that

"conventional functions still view the DP operation defensively despite the fact that most major companies' systems are 50% to 75% computerized. This could be termed business 'culture lag.'"

'Glorified Adding Machine'

Perhaps most directly pointing to the feelings corporate executives show toward DP is this quote from the senior vice-president — finance — of a major pharmaceuticals manufacturer: "A

Why our MARKLINK™ Terminal



"I don't know what you guys see in these computers..."

IN DEPTH

computer is nothing but a glorified adding machine — a good manager gets things done through people and uses all he can. Computer people can get, gather and shape information, but a manager must *himself* know what he needs to run a company or division.

"There has been too much glory for the programmers and operators when they really know little else but the machine."

For all the criticism and dialogue, there is little communication. Corpo-

rate executives recognize in large proportions (74.4%) that DP efforts in their companies would improve if they would learn more about DP. They think DP planning could be better, but as top executives of their firms — people for whom planning is a daily function — they remain largely aloof from DP projects despite their expressed good intentions.

Repeatedly, the study showed good intentions coupled with bad performance. Executives recognize the value of

a course in computer concepts — 80% stressed that it is worthwhile — yet 40% had never taken such a course. IBM has a course which is generally close to what corporate executives say they want, and the American Management Association makes some attempts to keep senior-level executives abreast of changes in technology and their impact on corporate life. There are few other meaningful courses available from manufacturers, consultants and universities, and the problem

of getting senior-level executives to class is difficult.

But even when these executives have the chance to learn from their own staffs — and to ask their own questions — they don't.

The majority of corporate executives who responded to this study said they thought joint meetings would help communications, yet not one industry group indicated that even 50% of the companies it represents hold joint meetings at all. A large number of corporate executives think having the managers attend corporate officers' meetings would be a fine idea, but they say practically no one does it. Of the insurance executives responding, not one, according to his own statements, had ever taken a computer concepts course!

There is general agreement among DP executives that they would welcome more management involvement in DP. Half of the DP executives said they would like to understand management goals better and two-thirds of them would welcome the opportunity to attend corporate officers' meetings. Yet their proposed solutions for improvements seem almost too blameless.

Just as corporate executives have done little to prepare themselves to communicate with or to guide processing executives, DP people have been reticent about acquiring business knowledge. Perhaps they do wear rose-colored glasses which allow them mostly to view corporate executives as pleased enough with the contributions of DP to the company. Perhaps they have become resolved to being regarded as perpetual underlings despite their control over a resource which is rapidly becoming the heart of communications in industry.

DP Managers' View

It is clear that DP executives feel — with the possible exception of those in the banking industry — that senior-level management does not consider them knowledgeable enough in business to move into corporate management. They are strong in their belief that senior management views them as technicians with insufficient backgrounds in business. Yet they do precious little to correct the situation.

Few DP executives appear to have had much formal training in business subjects, but perhaps more striking is the fact that few seem to care. Fewer than 20% expressed any desire to take business courses other than those that directly tied into their jobs. Their apathetic present, it seems, was causing them to have little future.

Perhaps what writers have written and the 179 respondents to this study have said in retrospect is that the most common grounds for communication between corporate and DP executives is their mutual unwillingness to take the first step to convince each other that they, in fact, have a great deal to learn from each other and a great deal more they could accomplish together.

(Continued on In Depth/10)

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GENERAL  ELECTRIC

IN DEPTH

(Continued from In Depth/9)

One respondent to the study wrote, "The most needed ingredient is an interactive, synergistic relationship between user and DP people based on trust and mutual respect. Then each brings his own expertise. Neither need be expert in the other's field. The whole become greater than the sum of its parts."

Computers, in many ways, have become as much a frustration to management as a useful tool. Numerous

writers point out that, instead of watching and controlling this investment, many senior executives have retreated to the safety of their expertise in other business areas and simply delegated responsibilities for use of computers to lower ranking executives. Corporate executives have trouble defining what they want; data processing personnel must reconcile technical factors that make a system work and that may alter what the user thinks he want.

Computer systems force changes in

organization and lines of communications which are disturbing to many corporate executives. This is particularly emphasized by major data base efforts, their placement in organizations and the accountability they require.

McKinsey and Co. discovered in the 1960s that no company got effective use from its computers unless there was active participation by top executives. Alarming, 18 of 27 of the largest computer users were found to

have marginal returns on their DP investments. Things haven't changed much.

Aligning Business, Systems

Top management's attention should be focused not only on the huge investments represented by computers, but also on bringing into alignment plans for computer systems and plans for the business in general. Both computer systems plans and business plans should be reviewed in exactly the same manner.

Failure of top management to participate actively has an effect on the makeup and functions of the whole business organization, as well as its ability to adapt to change.

In the long run, no company can be better than its computer system. The question becomes: Who actually is designing and approving the computer systems that are central to the company — top executives or DP people? The responsibility falls too often to DP specialists who do not have the same business experience, training or overall perspective of corporate executives.

When responsibility for the design of systems falls to DP executives, they tend to resist changes in systems and programs and, instead, tend to produce what is more comfortable for themselves rather than what is most effective for the user.

McKinsey found that when proposals for new DP applications were challenged as to their profitability, good answers were rarely available.

Poor definition and inadequate dissemination of corporate objectives seriously affect the definition of the company's information systems. Management not only must refuse to abdicate responsibility for computer systems, but should make a point of learning enough about computer systems to control them effectively.

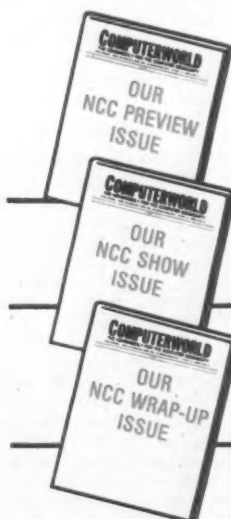
Appropriate Training

Computer courses available to executives are generally too technical to be of any significant value. The purpose of training executives in DP should be to encourage them to think of ways of improving existing applications and guiding the development of new ones that can provide relevant, useful information for decisions that minimize operating problems and optimize the potential for profit.

It is absurd to teach corporate executives to program and then expect them to get intelligently involved in DP planning. The bits and bytes of programming are at totally opposite ends of the "big picture" perspective corporate executives must keep. Interest, understanding, comfort and appreciation come from being able to read and use output, not from understanding how a program is written and run.

DP professionals, on the other hand, tend to limit their education to the extreme of bits and bytes. While some have moved into corporate executive jobs, most must be better educated in business matters before they can expect much personal growth in their

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companies.

Consultants differ sharply on the likelihood of DP professionals rising to the top of their organizations. Booz-Allen & Hamilton showed that data processing executives more often than not report to financial officers. Therefore, considering their lack of training and pertinent experience, there is little chance they could ever develop in areas of finance enough technical expertise to enable them eventually to succeed their bosses.

To follow the thinking of Robert Katz, at the first level of management the emphasis must be on technical and human skills. (For DP people rising within a DP career path, technical skills can mean DP skills; for the DP executive looking to succeed a financial executive, the required technical skills are most apt to change to financial skills — skills he usually does not possess.)

At higher levels of management, Katz sees the requirement for technical skills diminishing and the new emphasis placed on human and conceptual skills.

At the top, conceptual skill becomes the most important skill of all for successful administration¹¹. (For top-level corporate executives, lack of conceptual skills may well extend to their views of the communications structure of their organization and of the impact of computer applications.)

Orlicky says it would be far wiser for an executive to learn something about systems and computers rather than depend on technical experts to learn the business.

Most Important Courses

According to corporate executives surveyed, if they were to take DP courses, most important to them would be computer concepts, using models, database concepts, project planning and estimating techniques. DP executives agreed except that they thought a course in systems analysis would benefit senior executives more than the course in estimating techniques (see Figure 7).

The five most important business courses for budding company presidents — according to corporate executives — are economics, financial accounting, decision-making, finance and writing. The five most important business courses for future DP managers — selected by DP executives — are decision-making, problem-solving, business information systems, writing and financial accounting. Ironically, fewer than 20% of the DP executives responding to this study said they have any interest in pursuing business training.

Perhaps the greatest irony, though, is that we have evolved into a knowledge society for whom information processing technology has extended the speed, breadth and depth of our abilities to make decisions. As our ability to gather, interpret and disseminate information becomes more advanced, we should be reaching points of proficiency and optimization in business

BUSINESS MANAGEMENT COURSES Ranked in Order of Importance		DATA PROCESSING COURSES Ranked in Order of Importance for Senior-Level Executives	
for Future Corporate Presidents	for Future Data Processing Manager	by Corporate Executives	by Data Processing Executives
Economics	Decision-Making	Computer Concepts	Computer Concepts
Financial Accounting	Problem Solving	Using Models	Data Base Concepts
Decision-Making	Business Information Systems	Data Base Concepts	Using Models
Finance	Writing	Project Planning	Project Planning
Writing	Financial Accounting	Estimating Techniques	Systems Analysis
Management Psychology	Management Psychology	Introduction to	Introduction to
Problem Solving	Public Speaking	Teleprocessing	Teleprocessing
Marketing	Business Policies	Systems Analysis	Estimating Techniques
Public Speaking	Managerial Accounting	Systems Design	Systems Design
Managerial Accounting	Management Theory	Programming Concepts	Computer Organization
Management Theory	Finance	Data Communications	Data Communications
Business Information Systems	Statistics	Real Time Systems	Real Time Systems
Business Policies	Economics	Computer Organization	Programming Concepts
Business Cycles & Forecasting	Business Cycles & Forecasting	Operating Systems	Hardware Configurations
Statistics	Marketing	Hardware Configurations	System Simulation
Operations Research Techniques	Principles of Auditing	System Simulation	Operating Systems
Theory of the Firm	Operations Research Techniques	Algorithmic Processes	Algorithmic Processes
Principles of Auditing	Theory of the Firm	Computer Systems Architecture	Computer Systems Architecture
		FORTAN	FORTAN
		COBOL	COBOL
		Assembler Language	Assembler Language

Figure 7. Business Management and DP Courses Ranked by Executives According to Importance

that will ensure continued competitiveness and profitability.

Certainly the caliber of people in business is improving constantly. The Dun & Bradstreet Directories show an impressive number of graduate degrees among the top executives of many corporations.

In terms of technology, we are at a highly advanced state in which we are capable of processing data at billionth-of-a-second speed and printing it at more than one million characters per minute.

Nearly everyone employed in a white-collar job is at least a high school graduate; certainly most people have had post-high school training in colleges, business schools or the military.

Why is it then, that companies of all sizes and all industries, run and staffed by intelligent, educated people at all levels and supported by incredibly fast and reliable equipment, rarely can put together these resources into smooth and proficient organizations?

Aiming at Best Possible

In most cases, computers are intended to provide the closest thing to perfect information within the constraints of time, available input and cost effectiveness. Certainly, no executive denies the value of good information and every executive wants his decisions based on the best information available.

Most astute executives are also aware of the communications filters that exist in every organization. Information that rises to the top is rarely pure; it is colored by individuals at every level who determine what is relevant, what is politically right and what they feel the individual above them ought to

know. Usually, the information released from each level is that which can be defended or is championed by the individual who serves as the filter at that level.

So it is with computer systems when top executives fail to assign direct accountability or, worse yet, fail to lend

their insight, experience and knowledge to the thinking that results, ultimately, in computer systems that provide information essential for key management decisions.

By executives' recognition and by their own admission, computer

(Continued on In Depth/12)

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IN DEPTH

(Continued from In Depth/11)
professionals basically are technicians with limited expertise, at best, in business matters outside the DP environment.

When a top corporate executive delegates design responsibilities down through his organization, there must be a point at which those given the responsibilities, think they are asking for — or demanding — information that those above might want to know. Communication with DP specialists may be dangerously dictatorial or it may run to any degree of delegation.

It is, unfortunately, not uncommon for systems designers to be left with the responsibility for determining how flexible a system ought to be, the kind and format of data to be handled and the kind and formats of reports to be issued on the subject and within the time schedule set by the user. Most systems designers, given this opportunity, will revert to previous successes — implemented systems on which complaints were minimal or at least not loud — and will use methods and procedures which have worked before.

Result: Confusion

The end result, predictably and frequently, is that the user receives reports on subjects of importance to him in a format that he and his staff may find difficult to understand. In many cases, such reports contain infinitely more data — and pages — than they need to contain, and they are more a source of confusion than help.

Data in most systems exists not because it is necessary, but because some corporate executive or some DP professional thinks someone, someday, may need it. Instead of producing clean, informative and useful reports, then, such systems introduce nothing more than a printout of a filter system and, as such, contribute little to the decision-making capabilities of high-level executives.

The point comes back to someone at

the top knowing — or wanting to know — what computers in his company are being used for, what information is being produced and what decisions are now able to be made that perhaps could not have been made using previous systems. They need to ask — or advise on — how these information systems and decisions can be further improved.

Most important, they must create the communications climate that first informs those below them of their inter-

est in what kinds of usable information are being produced in return for DP expenditures, and they need to establish the mechanism for feedback to ensure that their interests and desires are, in fact, being satisfied.

Cases in Point

Two specific conversations I participated in may serve to illustrate the communications gaps that exist and how these gaps inhibit the education and potential responsiveness of the

people concerned.

A vice-president of a multibillion-dollar financial company was asked about scheduling a course in computer concepts and applications for the top executives of his company.

"Top-down training makes the most sense," he advised. "We'll start the program with vice-presidents, as a group, and work down to supervisory levels."

I reminded him politely that it seemed more important and appropri-

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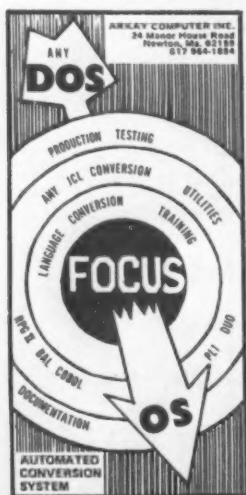
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IN DEPTH

ate to have the chairman and president trained than anyone else, and therefore, he should start at the very top.

"In this company," he said, "no one suggests to the chairman that he needs training!"

I suggested that, given the company's annual DP investment of more than \$20 million, we might invite the chairman to attend.

"No, you won't or you won't train anyone in this company," he answered threateningly.

"Perhaps you need to consider," I suggested, "that better use of your computers can mean more business but, also, failure to control the direction and performance of your computer systems can lead to long-term problems."

"If computers fail to keep you competitive or if you lose control over the information you need to run your business — or if for any reason someday you couldn't get it — your ability to compete effectively in your markets

could be sharply diminished. Doesn't that make the subject important to the chairman?"

He answered simply and directly, "When and if the chairman wants training he will tell us. That is highly unlikely."

In another conversation, a manager of systems and programming said that he would like to take courses in accounting and statistics.

"Why don't you?" I asked.

"Can't afford them," he answered.

"Doesn't your company have a tuition assistance program?" I asked, sure that it did.

"Sure it does," he answered, "but it would never go along with my taking these kinds of courses. I'm supposed to know this stuff somehow. I'll wait until I don't need the money for something else. Then I'll do it and, if my bosses find out about it, it'll be because I'm answering their questions better."

Those conversations were real. They may or may not be typical. Both persons worked for large, Fortune-listed companies.

Their attitudes and fears may not accurately reflect the thinking of the chief executives of their companies, but they do point to basic failures in communicating corporate thinking and in top management's sensitivity to such communications problems.

The questions to resolve, I think, are what education management ought to get, but perhaps even more fundamental, how management can be made to recognize the impact of poor communications on company information systems.

A corporate officer of a major oil company, one of the largest users of computers in the world, wrote that no one individual in his company is versed enough in its widespread use of computers to answer questions about their costs and effectiveness. If that is true, then certainly it ought to raise questions about communications and the placement of controls in the organization.

Basic Solution

The solution to the problems discussed in this study rest in the basic thinking of top level corporate executives who, to again paraphrase Robert Katz, need to be able to see computers in clear, conceptual terms as central resources and who may not be equipped to do so.

If training is a partial answer, then business schools, early in the careers of executives, must teach concepts and applications and challenge young executives to think creatively about the uses of computers. Courses should not be technical and should not be aimed at winning the sympathy of executives towards technical problems. And they should be taught by businessmen, not technicians.

If communications is a partial answer, then executives need now to look at their chains of command and their

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IN DEPTH

(Continued from In Depth/13)

charts of organization from a communications viewpoint. They must determine at what levels decisions are being made on what information is to be produced, and they must identify the filters. Top managers should be sure they are getting enough direct information and should look for ways in which computer systems might be used better to produce clearer, more useful information.

Perhaps even more important, execu-

tives need to look at what computer systems exist in their organizations and why. They ought to review them thoroughly enough to be satisfied they are cost-justified.

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Robert S. Hoberman is an assistant vice-president of Continental Insurance Companies, New York.

A human resources executive with a diversified background that includes 12 years in DP, Hoberman has published widely in the trade press on matters of selection, placement and training of systems personnel.

While director of educational services at Inco Systems Corp., a division of Continental Insurance, Hoberman designed and directed the development of "The Programmer Knowledge Survey," an automated skills assessment device for programmers.

Hoberman holds a B.A. degree from Fairleigh Dickinson University and an M.B.A. degree from Pace University.



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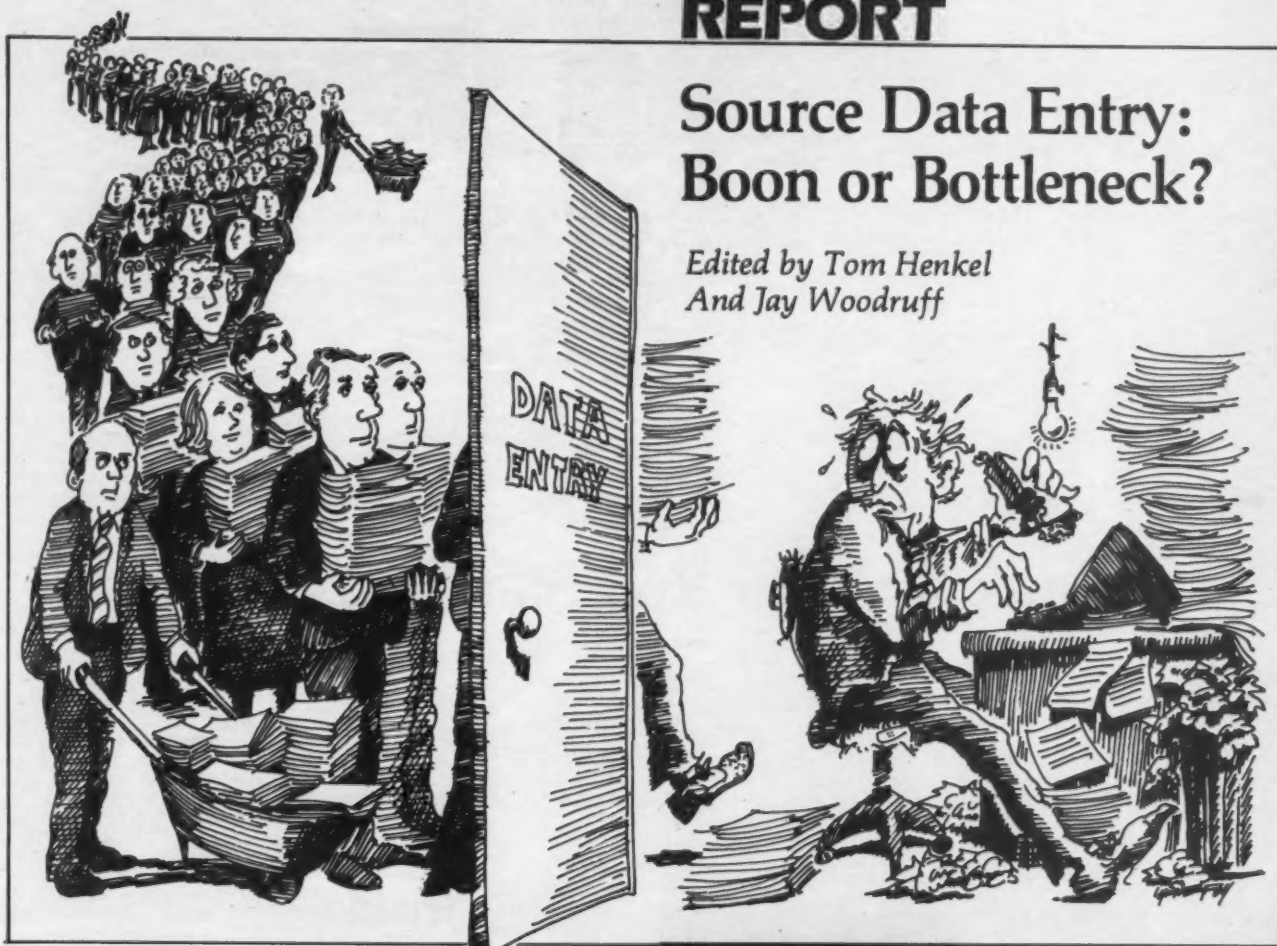
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Source Data Entry: Boon or Bottleneck?

*Edited by Tom Henkel
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COMPUTERWORLD 

Wide Variations Found

Dema Surveys Data Entry Salaries, Productivity

By Jay Woodruff

CW Staff

STAMFORD, Conn. — The performance of data entry shops varies widely, and ways must be found to make them more productive, according to a recent survey by the Data Entry Management Association (Dema).

The "Member Statistical Compensation Survey," the

first such effort attempted by Dema, examined the work habits, productivity and pay scales of 110 data entry departments in business, government and education — as seen through the eyes of their data entry managers.

Productivity could be increased by means of incentive programs in which the operator is paid extra for work in

excess of the average done throughout the shop, the survey indicated. While only 11% of the responding firms had incentive programs, they were also 28% more productive as measured in keystroke/hour. Companies without an incentive plan averaged 10,367 keystroke/hour, while those with incentives scored higher at 12,404 keystroke/hour.

Surprisingly, however, the data entry department that claimed the highest average keystroke rate — 18,000/hour — had no incentive system at all. That department — at New Hampshire/Vermont Blue Cross and Blue Shield — is a seven-member group of operators and its supervisor (see article on Page SR/8).

Salaries by Job

Dema asked the companies' data entry managers to indicate salaries for themselves and their employees. The results showed wide variations.

For average operators, the salary was \$9,781 per year, but salaries ranged from a low of \$6,840 (part-time) to \$17,160. A top operator in contrast earned \$11,624, within a salary range of \$6,840 to \$19,608.

Trainees were reported to earn \$8,000 a year, with the highest reported salary

\$12,876. A third of the trainees earned at least \$8,400 annually, the survey said.

First-level supervisors earned \$14,124 on the average, while low and high salaries were \$7,740 and \$29,000.

city. In San Francisco, for example, salaries ranged from \$7,020 to \$13,932 a year for an average operator. Many factors — unionization, shortages of trained people and so on — "have to be taken into

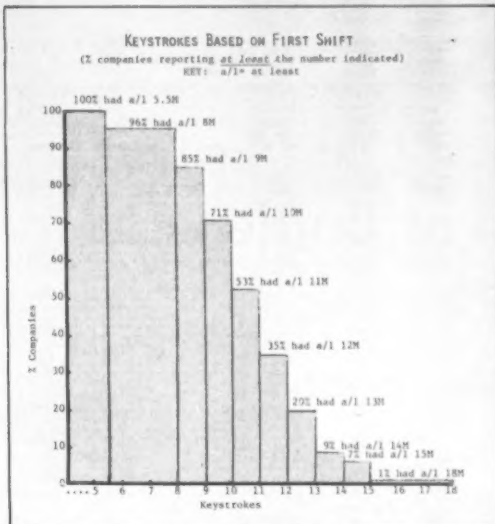


Figure 1. Only 1% of respondents reported 18,000 keystroke/hour.

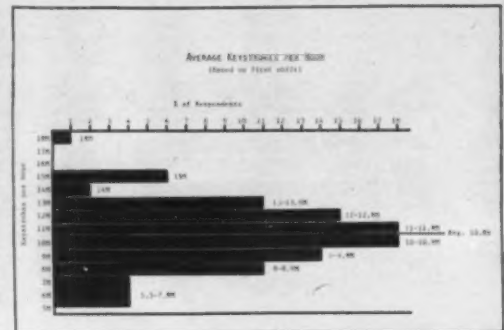


Figure 2. Average keystroke rate reported is in the 10,000- to 11,000 keystroke/hour range.

The data entry managers themselves reported an average salary of \$20,796. A number of factors, including the number of persons supervised and scope of responsibilities, may have contributed to the monetary distance between the low (\$10,920) and high (\$48,000) salaries reported here.

Large variations in salary occurred even within the same

consideration when viewing the figures," the report cautioned.

An average data entry shop worker will get an 8.13% raise this year.

While the data entry department is thought by some to impose some of the most tedious working conditions in DP, only 5.49% of all workers were absent at any one time, and

(Continued on SR/10)

DPers Look First For Reliability in Equipment

ELLCOTT CITY, Md. — How does the average DP decide on data entry equipment? Most look for reliability, followed by flexibility and then support, according to a recent survey of 110 DP managers and data entry experts.

Throughput came in fourth in the rating, followed by price and ease of use, according to Impact Marketing Services (IMS), which conducted the survey.

IMS asked DPers from 10 basic business areas to rate the six criteria for usefulness in choosing data entry equipment. The DPers were asked to score the most critical area lowest and to give the least critical area the highest rating. From that data a weighted average was prepared, IMS said.

Manufacturing, Insurance

Consistent with the norm for DPers in general, DPers in manufacturing indicated that reliability is their key factor in choosing a data entry system. That category received a 1.8 rating. Flexibility and support tied at 3.5 each, followed by throughput with a 3.7 rating. Price and ease of use both tied at 4.1, the survey said.

DPers in the insurance business agreed that reliability is

the most important factor and gave it a 2.5 rating, followed by a rating of 3.1 for flexibility.

The insurance DPers, however, thought price to be more important than support and throughput. Price rated 3.6 in the survey, while ease of use came in fourth with a 3.8 rating.

Support rated fifth for these respondents with a 3.9 rating; throughput came in last, scoring 4.0, the IMS survey said.

Financial, DP Services

DPers in financial services disagreed with most of the rest of the DP community. Those DPers said flexibility is the most important thing to look for in a data entry system. Their rating for flexibility was 2.1; reliability came in a close second at 2.2.

As in the norm, support placed third with a 3.0, but ease of use ranked higher than among insurance DPers, with a fourth place 3.5 rating. Throughput was fifth at 4.1.

Price was apparently no object in the financial services business. That consideration came in last with a 5.4 rating, the survey said.

Respondents in DP services agreed with those in financial

services in scoring flexibility as most important. It rated 1.9, followed by reliability with a 2.2 rating.

DP services personnel also wanted fast machines. Throughput ranked high with this group, with a 3.5 and was followed by support with a 3.7.

Price rated a high 4.3. DPers in DP services apparently did

not give much thought to ease of operation, scoring that category 5.2, according to the survey.

Wholesaling, Retailing

In wholesaling, reliability regains top place as the key factor in choosing a data entry system. Ease of use came in second with a 3.3, and throughput came in third with

a 3.5, according to the survey.

Support and flexibility tied for third with these respondents, and price registered last as a buying influence at 4.7, the IMS survey said.

In contrast, DPers in retailing chose support as the most important factor, assigning it a low 1.5. Reliability came in second with a 2.0, and flexibility

(Continued on SR/10)

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Major Offerings in Key-to-Disk Data Entry

The following charts represent a partial listing of the common key-to-disk systems available for data entry. It is by no means a definitive list, but it does represent much of what is available for high-volume data entry shops.

The charts should not be used to make di-

rect comparisons among systems, but rather to give the reader a general idea of what is available. Most systems have a particular blending of characteristics that makes comparison difficult.

Some manufacturers offered specific prices for their key-to-disk systems, while others offered more general prices because their systems include too many hardware and software combinations to list in chart form. Where possible, prices are given for medium-size system configurations.

SYSTEM	Nixdorf Computer Corp.		
CHARACTERISTICS	280	380	480
KEYSTATION STYLE	IBM 029, or typewriter with numeric pad	Same as 280	Keypunch or typewriter with 10-key numeric pad, 64 alpha-numeric characters
NUMBER OF KEYBOARDS AVAILABLE	16	22	32
CPU	Control Data Corp. minicomputer with 32K to 64K bytes of memory	Same as 280	Same as 280
DISK SIZE	4.8M bytes	9.6M bytes	4.8M bytes to 132M bytes configurable in one or two 4.8M-byte fixed disks and one or two 33M- or 66M-byte removable disks
TAPE DRIVE (Bit/In.)	One 800/1,600 unit	Two drives in 556/800 or 800/1,600 format	Up to four tape drives
COMMUNICATIONS	IBM Bisynchronous with either system-to-system or system-to-host communications	Same as 280	Same as 280
USER PROGRAMMING	Programmable for a variety of data entry functions using a Cobol-like language called Editor	Same as 280	Same as 280, but user can specify field sorts; optional Advanced Data Entry Executive allows user to run programs from outside this system
PRICES	\$19,970 for 32K-byte mini, communications controller, 800 bit/in. tape and 4.8M-byte disk; keystations sold separately for \$2,080 each; leasing costs \$466/mo on a three-year plan; maintenance at \$160/mo; keystations leased for \$46/mo and maintained for \$21/mo	\$35,300 for 64K-byte mini, communications controller, one 556/800 bit/in. tape drive and 4.8M-byte disk; leasing costs \$822/mo on a three-year term; maintenance costs \$208/mo	\$43,520 for 64K-byte mini, communications controller, one 556/800 bit/in. tape drive and 9.6M bytes of disk storage; leasing on a three-year term costs \$1,020/mo; maintenance costs \$261/mo

SYSTEM	Cummins-Allison Corp.		
CHARACTERISTICS	2400	5400	6400
KEYSTATION STYLE	Keypunch with numeric pad or typewriter with numeric pad	Same as 2400	Same as 2400
NUMBER OF KEYBOARDS AVAILABLE	Up to 8	Up to 32	Up to 32
CPU	Modified General Automation, Inc. minicomputer with 97K-byte memory	Same as 2400 but with 128K-byte memory	Same as 2400 but with 196K-byte memory
DISK SIZE	2.5M or 5M-byte drives available	Same as 2400	Same as 2400
TAPE DRIVE (Bit/In.)	556/800 or 800/1,600	Same as 2400	Same as 2400
COMMUNICATIONS	Microprocessor-controlled; all models use two asynchronous ports and support IBM 360/20 and 2780/3780, Burroughs Corp. remote job entry and Cummins' own system-to-system protocol		
USER PROGRAMMING	Cobol, RPG-II	Same as 2400	Same as 2400
PRICES	\$36,500 for 64K-byte mini, 4.9M bytes of disk storage, 2,400 bit/sec communications and four keystations; leases for \$787/mo on four-year plan; maintenance costs \$271/mo	\$67,500 with 96K-byte mini, 9.8M-byte disk, 1,600 bit/in. tape and eight keystations	\$83,500 with 128K-byte disk, 1,600 bit/in. tape and 12 keystations
NOTES	Model 2400 designed primarily as remote data entry system; all models have 50 utility programs, including file printing and tape output; all permit simultaneous scanning of documents, pages and credit cards when a variety of options are added.		

Lineup of Key-to-Disk System Manufacturers:

SYSTEM	Northern Telecom Systems, Inc.	Univac Computer-Aided Data Entry (Cade) 1900	Cade 1900/10
CHARACTERISTICS	Keybatch 74		
KEYSTATION STYLE	Keypunch or typewriter with numeric pad	Keypunch adding machine, typewriter	Same as 1900
NUMBER OF KEYBOARDS AVAILABLE	1 to 16 per processor	1 to 32	1 to 32
CPU	64K-byte mini; second mini can be configured either as dual processor with high communications speeds for 16 keystations or to handle 32 stations	64K- to 128K-byte minicomputer	Minicomputer with 512K-byte maximum memory
DISK SIZE	2.5M, 5M, 10M and 20M bytes in either fixed or removable disks	2.2M, 4.4M, 8.8M, up to 35M bytes	Up to 400M bytes
TAPE DRIVE (Bit/In.)	800 or 800/1,600	556/800/-1,600; handles up to four tape drives	Same as 1900
COMMUNICATIONS	IBM 2780/3780, 360 Hasp; Control Data Corp. 200 UT; Univac 1004; Honeywell, Inc. Gerts	IBM 2780/3780, 3741, 360/20 Hasp; Honeywell, Inc. Gerts	Same as 1900, but adds SNA/-SDLC on Model 1700 terminal
USER PROGRAMMING	Validation techniques available as well as media conversions, data formatting, extensive editing with RPG and batch balancing; system generates own job and operator statistics	Cobol-programmable; Codaasy standard data base; any terminal can drive peripherals; remote printers and terminals are hardware-transparent, require no programming to operate with Cade system	Same as 1900, but adds 3270 passthrough under user program control
PRICES	\$66,348 with single mini, 600 line/min printer, 5M bytes of disk storage and eight keystations; maintenance costs \$590/mo; leases available	\$77,568 with 64K-byte mini, 4.5M bytes of disk, 800 bit/in. tape drive and 10 keystations; lease costs \$1,242/mo over 36-mo term	\$85,092 with 128K-byte mini, 800 bit/in. tape drive, 4.5M bytes of disk and 10 keystations; lease costs \$1,341/mo over 36-mo term
NOTES	Dual-processor configuration allows up to 16 keystations to operate up to 50K bit/sec or 32 keystations to operate up to 19.2K bit/sec; system communicates disk-to-disk, disk-to-tape or disk-to-communications peripheral selector (in dual-processor mode)		Designed primarily as distributed processor supporting large-screen terminals and printers

SYSTEM	Mohawk Data Sciences Corp.	1200	2400
CHARACTERISTICS			
KEYSTATION STYLE	IBM 029, keypunch, typewriter		Same as 1200
NUMBER OF KEYBOARDS AVAILABLE		4 to 16	1 to 32
CPU	48K-byte minicomputer with 48K to 64K bytes of memory		Mini with 48K to 128K bytes
DISK SIZE	1.4M to 5M bytes fixed or removable		2.5M to 80M bytes fixed and removable
TAPE DRIVE (Bit/In.)	200/556/800 dual-density disks or 800/1,600		Same as 1200; can support up to eight drives
COMMUNICATIONS	IBM 2780/3780, 2968 (IBM tape-to-tape emulator); Mohawk synchronous protocol for key-to-tape data record; large-block bi-synchronous communications up to 56K bit-sec; with high data compression		Same as 1200, but adds ability to communicate at 9,600 bit/sec while keystations are in operation; when keystations idle, system can communicate up to 56K bit-sec; also supports IBM 360/-20 and 360/22, Univac 1004, 9000 remote and BCT-2000, Honeywell, Inc. Gerts and General Electric Co. Remote Terminal System; IBM 3776/3777 emulator under test
USER PROGRAMMING	User can create format for specifying data; user programming language allows extensive editing routines for use on field-by-field basis; highest level of programming includes batch programming language allowing user to access data on disk and tape and use any peripherals to print reports		Same as 1200
PRICES	Approximately \$36,960 for 64K-byte minicomputer, 2.5M bytes of fixed disk, 9-track 800 bit/in. tape and eight keystations		Approximately \$72,000 for 64K-byte mini, 5M-byte fixed disk, 9-track 800 bit/in. tape, typical communications package and 20 keystations; maintenance costs \$700/mo

How the Major Data Entry Offerings Compare

SYSTEM	Pertec Computer Corp. PCC 1800 Model II		
CHARACTERISTICS		XL20	XL40
KEYSTATION STYLE	Keypunch, typewriter	Same as 1800	Same as 1800
NUMBER OF KEYBOARDS AVAILABLE	1 to 64	4	Up to 16
CPU	Digital Equipment Corp. PDP-11 with 96K to 256K bytes of memory	Minicomputer with 80K to 96K bytes of memory	Minicomputer with 80K to 512K bytes of memory
DISK SIZE	3.4M to 30.4M bytes	Two 2.5M byte diskettes	4.4M-, 8.8M- and 17.6M-byte disk drives with a maximum of either 35.2M or 70.4M bytes
TAPE DRIVE (Bit/in.)	556/800, 800/1,600 and 1,600	556/800, and 1,600	Same as XL20
COMMUNICATIONS	IBM 2780, 3741/3747, 3780, 3741 Hasp and mainframes with bisynchronous protocol	Information not available	Information not available
USER PROGRAMMING	Checkbox specification format, Kobol (Pertec's keystation-oriented interactive terminal language), RPG-II compiler for report generation, media conversion and user-generated applications	Information not available	Information not available
PRICES	Purchase price unavailable; system including 16 keystations, minicomputer with 192K-byte memory, 15.2M bytes of disk storage, 1,600 bit/in. tape drive, 300 line/min printer and communications package leases for \$4,150/mo	Lease price of \$710/mo includes two keystations, 80K-byte minicomputer, 5M bytes of diskette storage, 160 char./sec printer and a communications package	Lease price of \$1,930/mo includes 64K-byte executive processor, 96K bytes of total memory, five 480-char. CRT terminals and one 2K-char. terminal, 10M bytes of disk, 1,600 bit/in. tape drive, 170 line/min printer and communications package

SYSTEM	IBM 3760/3790	Inforex, Inc. 3100 Model 1	3200 Model 1
CHARACTERISTICS			
KEYSTATION STYLE	2760 key-entry station, each with two keyboards and CRTs	IBM 029, typewriter	IBM 029, typewriter
NUMBER OF KEYBOARDS AVAILABLE	12 dual-keyboard entry stations	16	16
CPU	3791 controller (three models available)	Minicomputer with 40K bytes	Minicomputer with 64K or 96K bytes
DISK SIZE	10M-, 20M- or 30M bytes	2.56M bytes	10M to 40M bytes, with both fixed and removable disks
TAPE DRIVE (Bit/in.)	1,600	Inforex specifies 800 bit/in. drives rated at 12.5 in./sec with 1,200-ft reel	Both 800 bit/in., 12.5 in./sec drives on 1,200-ft reel and 45 in./sec drives available
COMMUNICATIONS	Communicates with IBM 370 and 4300 series processors; can be equipped with SDLC protocol	Infosynch for communications among vendor's own models and Bisynchronous	Same as 3100
USER PROGRAMMING	User can define specific data entry application-oriented checking and editing functions	Program control formatting and report program package for reports on keystrokes, errors and time on terminal	Same as 3100, but adds extensive editing features to aid in programming the system; 96K-byte version uses Inforex language called Kobol, similar to Cobol
PRICES	\$99,348 with 3791 controller, 20M bytes of disk storage, 3411 magnetic tape and five dual-keyboard stations (Model 2760); maintenance costs \$655/mo; costs \$2,757/mo on lease or \$3,246/mo on rental for two-year plans	Approximately \$52,000 with 40K-byte mini, 2.5M-byte disk, 1,200-ft reel of 12.5 in./sec tape, eight keystations and Bisynchronous communications maintenance costs \$403; leasing available for \$1,266/mo on one-year term	\$63,000 with 64K-byte mini, 12.5M-byte disk, 1,200-ft reel of 12.5 in./sec tape and eight keystations; maintenance costs \$454/mo; leasing available for \$1,500/mo on one-year term

Lineup Of Offerings In Data Entry

SYSTEM	Consolidated Computer Corp. Key-Edit 1000	Key-Edit 2000	Four-Phase Systems, Inc. System IV/60 and System IV/65
CHARACTERISTICS			
KEYSTATION STYLE	Keypunch, typewriter	Same as 1000	Keypunch, typewriter
NUMBER OF KEYBOARDS AVAILABLE	Up to 16	Up to 32	16 (System IV/60) 24 (System IV/65)
CPU	Digital Equip- ment Corp. PDP-11/40 minicomputer	Digital Equip- ment Corp. PDP-11/34 minicomputer with 256K bytes	Minicomputer with 196K-bytes memory
DISK SIZE	Up to 29M bytes	Same as 1000	2.5M bytes fixed, 2.5M bytes remov- able; maximum configuration for disk drives is 2.5M bytes of fixed disk and 20M bytes of removable disk
TAPE DRIVE (Bit/In.)	556/800 or 800/1,600	556/800/1,600	None available; all information stored on disk
COMMUNICATIONS	IBM 360/20 Hasp and 2780/- 3780 protocols	Same as 1000	Ascii, IBM 360/30, 370/- 135, 2780/3780, 3270, Systems Network Archi- tecture, 3770 and 360/20 Hasp; System IV/65 adds 3776 SDLC and 3270 SDLC
USER PROGRAMMING	For any data entry applica- tion	Same as 1000	Two major programming packages avail- able: Data IV, which allows user to set up data entry ap- plications and offers file man- agement, batch communications and report generation on operator pro- ductivity, and Vision, which offers 3270 emulation and allows remote data base to access host data base
PRICES	Recently dis- continued, al- though it may still be possible to purchase the model	Approximately \$70,000 for mini, tape drive, 10 keystations	\$1,250/mo for 196K-byte mini, 5M-byte disk, 120 line/min printer and eight keysta- tions on four- year plan; larger configur- ation of mini with a 12.5M- byte disk, 300 line/min printer and 14 keysta- tions costs \$2,200 mo
NOTES			IV/60 and IV/65 aimed at dis- tributed pro- cessing market; like the IV/40 and IV/50, they handle data entry, but like the larger and more costly IV/80, they can function in processing areas outside of data entry

Faster Data Entry Rates Help Fight Inflation

By Norman Bodek

Special to CW

Every industrialized nation in the world has a better record of productivity improvement than the U.S., whose disastrous performance has been a major cause of inflation — not to mention its inability to compete effectively in foreign markets.

In the past 10 years, factory productivity has increased about 85% while office productivity has increased only 4% — shocking in light of the explosion in the use of computers. Somehow, the computer has allowed us only to keep up with ponderous mountains of paper work, created by both government regulations and corporate information needs.

As the cost of computers has been drastically reduced, the cost of labor has continued to skyrocket. We could do much more to motivate and inspire our staffs, and we must take advantage of some of the latest techniques to increase productivity.

Real Raises

Although Americans expect salary hikes each year, real raises will come only from innovations and better productivity. To illustrate, assume an automobile took 175 hours to build in 1979. If it takes the same 175 hours to produce it in 1980, the only way a company can increase salaries is to raise the vehicle's price — resulting in inflation.

If, however, the same car could be produced in 150 hours this year, there would be a labor savings that could be passed back in real increases to the worker. The same scenario can be applied to data entry. Faltering productivity is not a remote national problem. Something can be done about it.

In the recent Data Entry Management Association (Dema) Compensation and Statistical Survey (see SR/2), productivity, measured by keystroke/hour, ranged from a low of 5,500 to a high of 18,000. The organization with 18,000 stroke/hour — a department managed by Lindel Chapman and supervised by Barbara Davis at New Hampshire/Vermont Blue Cross and Blue Shield — was 327% more effective than its lagging counterpart on the low end of the scale.

Measured against the national average of 10,600 stroke/hour, the Vermont company was 170% more productive. If this figure were converted to dollars, it could represent a \$100,000 savings in the average data entry department.

Another unusual statistic the survey revealed was that companies utilizing an incentive system were 21.38% more productive than those without one.

Visualize what that could mean in dollar savings to your budget. Paul Banks, DP manager at Legg's Inc., who presented his incentive plan at last year's Dema annual conference, reported recently that his department of 32 operators was 40% more productive as a result of the two-year-old plan. Vermont's Barbara Davis, on the other hand, relies on a merit system and personal feedback rather than on a formal incentive system.

Circle Plan

Another successful tool being installed at a number of American com-

panies is the Quality Control Circle, a program developed by American professors 20 years ago and used extensively in Japan. It is estimated that eight million workers in Japan participate in a circle plan.

The Quality Control Circle programs takes workers off the machine for about one hour each week, when they participate in a group that suggests ways to increase the quality of products and services. What is the result for Japan? That society has been transformed from a nation of junk producers to one that manufactures the world's most competitive automobiles, cameras and electronics.

The Quality Control Circle — or "bottom up" philosophy of management — recognizes many heads are bet-

ter than one and affirms the belief that the worker knows his job best. If you want to increase quality and find ways of serving your clients better, ask the person doing the job.

Just begin to ask workers, and you will be amazed at the response. Those American firms that have been using Quality Control Circles have discovered that the time spent away from the machines during the group discussions has been more than compensated for by better products and direct savings innovated by the workers.

Westinghouse Electric Corp., Northrop Aviation Corp., International Harvester Corp., General Motors Corp., Lockheed Corp., and American Airlines are some of the companies using Quality Control Cir-

cles.

Data entry managers can change their companies' bottom lines substantially. This will require a willingness to act as well as a belief in one's own ability. Unfortunately, the American management system sends decisions downward. As a result, the data entry manager feels helpless and does not want to rock the boat.

This same data entry manager may reason that since nobody has complained about his performance recently, there is no necessity to improve further. With the current economic situation, however, each person has a responsibility to do his part.

Bodek is founder and president of Dema and is publisher of the Dema newsletter.



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Average 18,000 Keystroke/Hour Medicaid Operators Ranked Most Productive

By Barbara Davis

Special to CW

MONTPELIER, Vt. — The Vermont Medicaid Department of New Hampshire/Vermont Blue Cross and Blue Shield ranked the highest in data entry productivity in a recent survey conducted by the Data Entry Management Association (Dema).

Of 110 organizations surveyed throughout the U.S. and Canada, average keystrokes per hour ranged from 5,500 to 18,000; the latter figure is the performance of the data entry department at Vermont Medicaid.

The department began its climb into high productivity in November 1976, when the average production rate was 7,500 keystrokes an hour. At that time, New Hampshire/Vermont Blue Cross and Blue Shield had just moved from Concord, N.H., to Montpelier. The Medicaid Department is comprised of a claims department that works closely with the data entry department.

None of the six-member staff of operators at the time had ever used a key-to-disk station, although all had prior experience keying on cardpunch ma-

chines.

Why is this department now so productive?

For one thing, the layout of keying formats was made as easy as possible for the operators. Since the programmer here had worked previously as a keyer, the formats were designed with the operator in mind.

The operators were asked for suggestions that would simplify the job, and these changes were implemented. As a result, they were made to feel part of the decision-making process, not just an afterthought.

Although all operators can enter as well as verify, there is currently one main verifier. This has increased the output of the rest of the operators. As a motivation, the department does not verify an operator's work after that person has shown an ability to maintain an error rate of less than 1%.

Individual meetings are held on a weekly basis with each operator to review keystrokes, time on system and error rates. This gives the operator feedback on his progress and presents that person an opportunity to bring up any problems encountered during the

previous week.

At the end of each day, the volume of records and claims processed is announced, which tends to motivate operators to improve their performance each day. On an exceptionally good day, I often hold an impromptu group meeting to congratulate the operators on their work, which appears to help both the employee morale and attitudes.

Productivity Guidelines

The following are additional operator guidelines which may illustrate some of what it has taken to become so productive:

- No snacking is allowed at the keystations.
- When no smoking was announced in the department, smokers found that their keystrokes increased by a substantial amount.
- Chitchat among operators is discouraged, which allows for more concentration on work.
- Background music, played half the day, provides a relaxing change in the routine and helps prevent boredom.

The work is distributed to the opera-

tors each morning according to their production rate. For example, a keyer with a 16,000 keystroke average receives fewer batches than a keyer with a 20,000 keystroke average. This enables all operators to finish at approximately the same time.

When the operators complete their stack of work for the day, they help other operators until all work for that day is completed. Since work for the following day arrives late in the afternoon on the current day, no one ever has to wait for something to do.

This continuing input of material to enter is one of the single most important reasons for our excellent production rate. We are always in a position of trying to finish the day's work or trying "to beat the clock."

Operators have two five-minute relaxation breaks in addition to the regular two 15-minute breaks. These breaks are used to get up and stretch and get a "second wind."

There has been very little turnover; in fact, we now employ six of the original seven operators hired in 1976, which has greatly reduced any training time that would have been needed if the turnover had been higher.

Data entry uses a Univac computer-aided Data Entry (Cade) 1900 system with seven keystations, a CPU, a tape drive and a printer. Several operators have been given a brief training course on how to "power on" in the morning and write tapes. The training has given them a greater understanding of the console operator's job and just what it involves and has resulted in increased cooperation.

Cooperative Environment

Being located adjacent to the claims area has helped the data entry department develop a special rapport not usually found between a user department and data entry. Claims supervisors have been cross-trained in data entry, and each has spent six weeks supervising data entry. This has provided them a very special understanding of data entry work and procedures.

The result of this cooperative environment between claims and data entry has led to several improvements in document processing, according to the department director, Lindel Chapman. No longer are there blurred or unreadable claims submitted to the data entry area, largely because everyone knows the operators are instructed to "key what they see."

The recognition shown to the data entry department — whether from the supervisor or from upper level management — has had a major effect on the level of productivity within the department.

When employees are not sure if there will be enough work for the day, or if they do not receive a frequent appraisal of their progress, they tend to do what they have always done because they know that what was acceptable yesterday will probably be acceptable today.

Here we try to follow the Data Entry Management Association slogan: "Better and better every day, better and better in every way."

Barbara Davis is supervisor of the Vermont Medicaid Data Entry Department in Montpelier, Vt.

Little Recognition for Efforts

Data Entry Needs a Good PR Agent: Dema

Special to CW

STAMFORD, Conn. — "Although data entry people are among the hardest working people in the company, they are still haunted by the stigma of the old keypunch department. They could use a good public relations agent," according to Norman Bodek, president of the Data Entry Management Association (Dema).

Data entry represents more than 28% of the average DP budget, but earns for its efforts only about 2% of the recognition.

Keying at speeds of more than 10,000

strokes an hour "requires patience, concentration and extreme devotion to the job," but instead of being respected, operators are usually looked down upon by management, he said.

Bodek gave the following as examples of negative remarks he considers a common part of the data entry staffer's existence:

- "Anybody can do it!"
- "Their machines are continually breaking down."
- "It costs too much to enter data."
- "Data entry is a bottleneck."
- "They don't care about quality."

- "Boy, that work is boring."

While some forms of data entry can be boring, that shortcoming is often management's fault, Bodek claimed.

On-line data entry can create physiological problems resulting in boredom and stress because the operator has to cope with a delayed response time. If the operator's duties were varied to include user or customer interaction or other office functions, the on-line terminal could be more easily faced, he said.

Expertise Required

Watch the skilled professionals on a key-to-disk system, where the rhythm is natural. "They perform at fantastic speeds for long hours and produce with incredible accuracy. If you compare the accuracy of typing strokes and keying strokes, you will be amazed by the difference," Bodek commented.

However, nobody is perfect. Even if the operator verifies 100% of his keystrokes, there will be mistakes. Ninety-nine percent is good work, which means one record — defined as having an average of 40 keystrokes — from each 100 can contain an error.

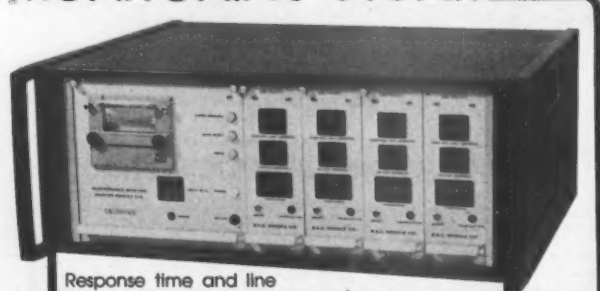
With the inclusion of balancing and edits such as range checks and table lookups, the average accuracy can be raised to 99.5%, or one record mistake out of 200, which "is very acceptable work," the Dema president said.

Data entry requires skill, devotion and a willingness to work very hard. On many occasions, the rest of the firm is off on a holiday, while data entry is there working overtime.

In addition, the operators are probably the most underpaid employees in the average company, he continued. Personnel managers should spend one day working in the department to obtain a real appreciation of the people

(Continued on SR/14)

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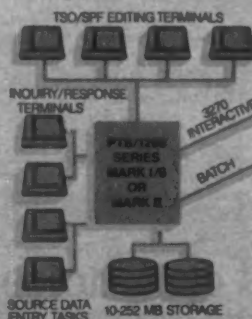
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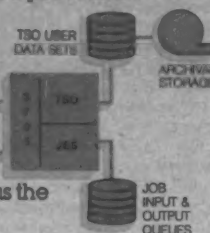
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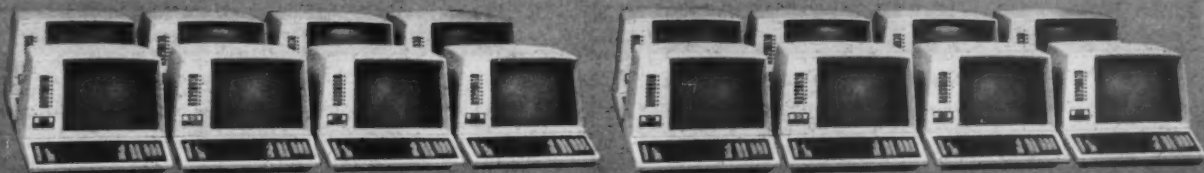
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Most Data Entry Material Hand-Delivered

By Tom Henkel

CW Staff

ELLICOTT CITY, Md. — Much of the material slated for source data entry is hand-delivered to the data processing site, according to a recent survey of DP managers and data entry specialists.

Conducted by Impact Marketing Services (IMS), the survey asked DPers to list the various methods used to move data within an organization. Public data communications networks were ranked first, with 44% saying that method is most frequently used.

However, the U.S. Postal Service (34%), private courier arrangements (30%) and company mail services (28%) came in second, third and fourth, respectively to indicate 92% of data entry material is hand-delivered to the DP department.

On a multiple-site basis, mail is used more frequently than other methods to move data in small organizations. Medium-size firms use data communications facilities and very

large, multisite organizations use private data communications networks for data transfer, according to the report.

"On a composite scale, both public and private data communications network services were reported to be the most widely used method of moving data," the report concluded. However, the report pointed out economics plays a big part in the type of communication system a company uses.

For Better or Worse

Asked if data entry has gotten better or worse in the three years from 1977 through 1979, more than 68% said it is better. A quarter said it has not changed and only five said it is worse.

Seventy-four percent of 100 DPers polled said they expect data entry techniques to be better in 1983. Nineteen percent said data entry will not change during the next three years, and 7% said it will get worse.

Switching from optical character

recognition to key-jot disk systems and putting source data entry functions on-line ranked among users' reasons for improvements.

Users who said data entry remained the same from 1977 until late 1979, when the survey was conducted, said antique equipment and a lack of education among users were the prime reasons.

Increased paperwork, more volume and an insufficient DP department were among reasons for the data entry function to have deteriorated in the 1977 to 1979 period, according to the IMS survey.

Asked what data entry areas should be upgraded during

the next three years, a majority — 67% — said the accounting department needs beefing up. Half of those polled said personnel needs more work, and 47.9% needed more financial data entry.

Marketing data entry should be given a boost, according to 44.7%, and 37.2% said data entry in manufacturing needs a helping hand.

Areas DPers said least need a data entry upgrade are planning (27%), industry-specific applications (19.1%) and engineering (12.8%), according to the survey.

Asked which cross-industry application is best suited for some form of data capture

system, 23.7% of polled DPers listed order processing as the best choice. Payroll-related functions came in second, receiving mention by 15.3% of DPers. Personnel functions scored a strong third with a 10.2% vote.

Other areas like accounts receivable and general ledger both received mention by 5.1% of DPers polled, and sales analysis was mentioned 3.3% of the time.

Accounting, contract administration, financial consolidation staff planning, transportation and vouchering each received one vote or 1.7%, according to the survey.

Dema Survey Finds Variations In Data Entry Pay, Productivity

(Continued from SR/2)

job turnover averaged 17.2%. Accuracy of keying and verification are important criteria in running a successful data

entry shop. The survey showed that the average operator's keying was 97.98% accurate and 31% performed at a level of 99% accuracy or better.

Operators verified an average of 71% of their keystrokes during the first shift, and 75% verified at least 50% of their work. This contrasted with the situation 10 years ago, when nearly all companies verified 100% of their keystrokes.

Of the companies surveyed by Dema, 89% said they now enter work that can be completed without verification.

Twenty-nine percent of the firms represented by respondents were manufacturing concerns, 13% were DPers, 13% were insurance firms and 12% were government shops. Service companies, banking and finance, transportation, utilities, medical, agricultural, chemical, retail and oil businesses each represented lesser percentages of the total sample.

Dema plans to publish a further analysis of its survey results, according to Norman Bodek, its president, and it may also run a comparison of male and female data entry managers' salaries.

Reliability Top Choice

(Continued from SR/2)

ity was a distant third with 3.8. Price was placed next as an important consideration at 4.0, and throughput at 4.3, and ease of use, at 5.5, followed, IMS said.

In education, reliability was ranked very important, but most other factors seemed to be of much lesser importance.

Unlike the majority of DPers, those in education awarded price second place, with a 3.2 score, followed by ease of use at 3.4 and throughput at 4.4. Support was judged least important, with a 4.6 rating, the survey revealed.

Government DPers looked for reliability which was followed by a two-way tie for price and flexibility at 2.8. Support and ease of use also tied at 4.4. Throughput came in last at 4.6, IMS said.

In transportation, flexibility was the key, pulling a score of 2.5. Reliability followed closely at 2.3. Support was important in this field, with a 3.0 ranking, according to polled DPers.

In the not-elsewhere-classified (NEC) group, DPers fol-

lowed the norm: reliability (1.5), flexibility (3.0), support (3.3), throughput (3.5), price (4.0) and ease of use (5.5). IMS said from 10318 Globe Court, Ellicott City, Md. 21043.

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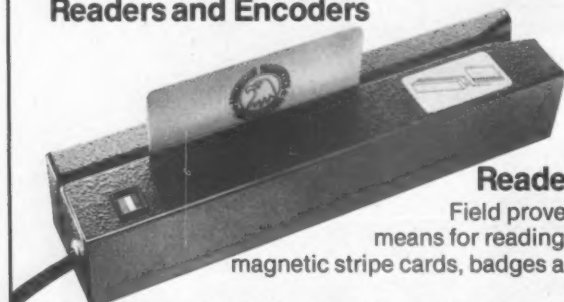
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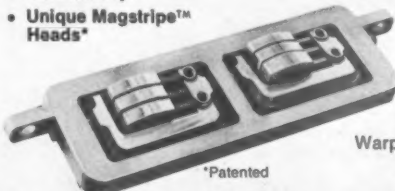


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Increasingly Complex Field Data Entry Training Falling Behind Technology

By Beth Buzby
Special to CW

While data entry technology has undergone a revolution, training for those who wish to enter the field has changed little, if indeed it has changed at all.

An organization considering the purchase of data entry equipment has an extensive, almost intimidating, array of devices from which to choose. Data entry personnel, on the other hand, still come in two basic models — competent and incompetent.

Data entry education began years ago when schools instituted keypunch courses to get maximum use from equipment purchased for program-

ming classes. The courses were designed to help students acquire the two skills then sought by employers: speed and accuracy.

Today, in a world of data entry devices that edit, respond to voices and communicate with one another, most data entry courses remain keypunch-oriented, training operators who, like the machines in the computer center, are intended only to be fast and accurate.

Changing Environment

Men and women coming into data entry today need more than the traditional keying skills to provide adequate service to their employers and to

advance their careers in this increasingly complex field. This changed and changing environment has been created by many factors.

Data processing departments have grown in size and complexity; the operator no longer sits in the same room with the systems analysts and programmers, seeing their work and its effect on daily activities in data entry.

Equipment and job descriptions are in an almost constant state of flux. There are now data entry analysts, data entry programmers, data control personnel and new positions with new responsibilities being created every day.

Developments such as word process-

ing bring in entirely new concepts to be considered. Rarely does an individual stay with an employer more than a year without seeing work patterns altered by equipment changes. Jobs in data entry are no longer confined to either operator or supervisor.

Broader Training

In order to adapt to these increasingly isolated and increasingly varied surroundings, entering employees must have a broader understanding of the general purposes and practices of the data processing department and how they relate to the data entry function. Operator preparation and training must also provide more comprehensive knowledge of data entry concepts and more information concerning the range of modern data entry devices, along with the skills needed to operate equipment.

Giving a student or trainee this increased breadth of knowledge is a demanding task, one which will require a new approach to data entry education. Current operator training practices are a classic example of duplication of effort. Schools offer data entry courses, while industry continues to provide on the job training (OJT).

Many employers feel that they must continue OJT because operators produced by educational institutions are too few and are not always well trained. A frequent complaint of data entry supervisors is that employees who come to them from the schools are not familiar with modern equipment or are generally underprepared.

Industry cannot expand its training programs to the scope required by today's conditions; its economic constraints prohibit investing the required amounts of time and money in employees who may or may not remain with the organization long enough to justify the expense of their training.

School Conditions

The schools, on the other hand, exist to prepare enrollees for gainful employment, but they are severely handicapped by the conditions under which they must operate. For example, a recent national survey of schools offering courses designated as data entry found that only 7% of those polled had key-to-disk equipment, 37% had terminals and 29% had key-to-diskette data stations, but 95% had keypunches.

Of the schools having keypunches, only 55% had buffered punches, and 20% were using some models that predated the IBM 029. This is hardly reflective of current industrial equipment.

Even in schools which have a reasonable configuration of devices, the number of each type of device is usually small, so that a teacher may have within one class 12 students working on unbuffered punches, 10 on buffered punches, two on a key-to-diskette data station and four on terminals.

This creates four subclasses within the class, and the instructor must juggle time on each machine for each student, lecture on each machine to the appropriate group, lecture on general concepts to the full class, supervise

(Continued on SR/14)

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Rising Importance of Dedicated Data Entry Seen

ELLCOTT CITY, Md. — DPers in manufacturing and DP services believe dedicated single-application data entry systems will take on an increasing importance in the next three years, according to a recent survey of 110 DP managers and data entry experts polled recently.

Conducted by Impact Marketing Services (IMS) here, the 20-question survey asked DPers their views on dedicated single-application data entry devices.

In overall responses, 38.3% of those polled said dedicated single-application data entry devices were increasing in importance; 23.4% said they were decreasing in importance; and 25.2% said they were unsure of their importance.

For 13.1%, the importance of dedicated single-application data entry devices would stay the same, according to the survey.

Response by Sector

Within specific business sectors, DPers in manufacturing seem to have had the strongest feelings toward dedicated data entry devices.

Sixteen of 32 respondents in manufacturing predicted that the use of dedicated data entry systems will increase from now until 1983. Five said the demand for dedicated systems would decrease while four anticipated no change during this three-year period. Seven others were unsure of the role of dedicated data entry systems, the survey said.

Of 11 respondents in the DP services business, six said dedicated data entry systems would increase in importance during the next three years. None said that role would decrease, and two said it would remain the same. Three DPers said they were unsure of dedicated data entry systems' role in the next three years.

Insurance Respondents

Of 15 respondents in the insurance business, five said the role of dedicated data entry systems would increase, while seven said it would decrease and one said it would remain the same. Two other DPers were unsure of dedicated data entry's impact, the IMS survey said.

Twelve respondents in financial services were split on the importance of dedicated data entry systems. Three said its role would increase by 1983, while four said it would decrease. Three said it would not change, and two were unsure, the report said.

In wholesaling, three DPers out of seven respondents said the role of dedicated data entry systems would increase. Two said it would decrease, and two were unsure.

In retailing, half the DPers polled did not have an opinion. Three said they were unsure, two said dedicated data entry importance would increase and one said it would decrease between now and 1983, according to the IMS report.

DPers in Education

DPers in education believed dedicated data entry will probably stay the same. One said it would decrease, two said it would remain the same and three were unsure.

Among government officials, more were unsure than had an opinion on dedicated data entry systems. Only two of five polled said dedicated data entry would be more important in the next three years, while the remaining

three were unsure, the IMS survey continued.

In transportation, one DPer said dedicated data entry would decrease in im-

portance, one said it would increase and two were unsure, IMS said from 10318 Globe Court, Ellicott City, Md. 21043.

TABULATION

Responses	Number	Percent
Increasing in importance	41	38.3%
Decreasing in importance	25	23.4
Unsure	27	25.2
Remaining about the same	10	9.3
Remaining about the same (that is, relatively high in importance)	2	1.9
Remaining about the same (that is, relatively low in importance)	2	1.9
TOTAL RESPONSES:	107	100%

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Operator Training Out of Step With Technology

(Continued from SR/12)

laboratory work, put together enough realistic assignment material to keep the entire class keying busily for two hours each day and then find time to check and evaluate the class assignments.

One of the instructor's most important attributes, currency in the field, is difficult if not impossible to maintain under such conditions.

Combined Resources

Industry has the necessary current equipment and procedures, while education has people with teaching expertise who want to teach and who are already being paid with tax dollars. A combination of these two resources could significantly diminish the training/retraining dilemma.

ing/retraining dilemma.

Tax-deductible donations of equipment to the schools by industry is an obvious step, but more comprehensive efforts can be more productive. Schools today are not confined by walls or limited to daylight hours—they spread throughout the community and teach at all likely and unlikely hours.

Classes are frequently scheduled at sites within businesses or organizations in order to provide special services or utilize special facilities. A data entry department can offer its facilities for school use at periods when the equipment is not in use or is at a low level of usage. The schools in turn can provide short courses for employees when equipment changes and can

produce qualified operators for the business.

If donation of equipment or equipment time is not feasible, forms and procedures can be shared. The creation of assignment material to approximate data encountered on the job is a difficult and time-consuming task. Most data entry instructors would eagerly accept formats, data (edited for privacy, of course) and procedures concerning information used by local installations. They could then produce graduates familiar with local practices.

Instructor Training

Lastly, instructors should be brought into a working environment for actual experience. Policies encouraging the extension of summer employment to

teachers would assist them in keeping up with new developments in the field as well as further cementing the training/working relationship.

Many of these mutually rewarding relationships already exist in various communities around the country. They present a logical approach to the challenge of providing the flexible and foresighted programs needed to update data entry education.

Forming a Circle

Past methods of producing and retaining capable data entry personnel bring to mind an illustration from a child's book in which a raging, towering mammoth is surrounded by humans bearing spears and stone axes. Somehow, through sheer courage and determination, these people are going to subdue the beast.

Training of capable data entry personnel is also a towering problem, but we, unlike the cavemen, have been taking turns attacking it. Although our weapons have improved, our success is minimal. The time has come to form a circle.

Buzby is coordinator, data entry systems, at Jefferson State Junior College. She is also the author of a soon-to-be-published textbook entitled *Data Entry: Concepts and Applications*, which includes a primer on the modern data entry shop and student exercises.

Data Entry Needs Good PR Agent

(Continued from SR/8)

working there.

But data entry managers, too, could do much to improve their workers' image in the company, Bodek said, and included the following suggestions:

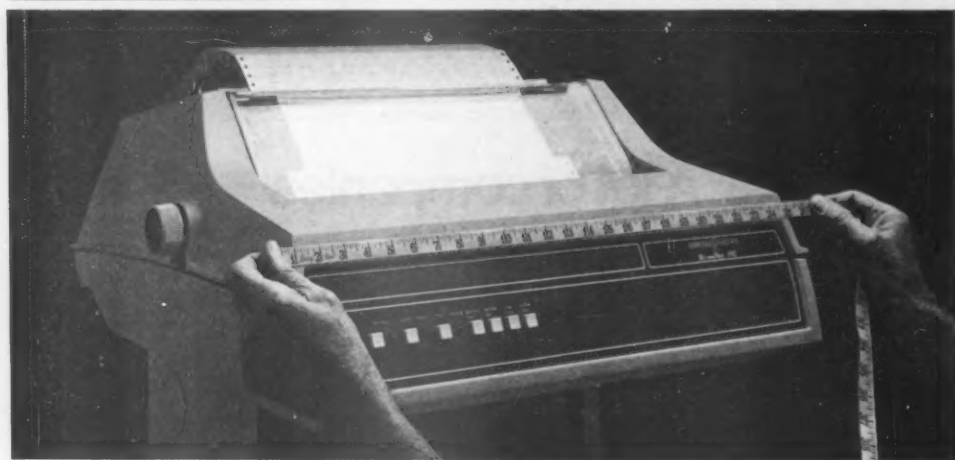
- Recognize that the customer is always right—and that the user is your customer. Accept full responsibility for errors and work with the user to find methods to increase quality.
- Offer your expertise to the user for forms design. Accuracy can be improved if more care goes into designing and filling in the source document. Often a form and entry program is designed without even consulting the data entry manager. It is silly not to use the company's best talents.
- Never criticize the user.
- Offer the user a "swap" program.

Send your operators to the user to learn more about the source material and to help out when you have lulls. Further, offer to train the user's employees to operate the data entry equipment.

- Prepare a demonstration for upper management and users of some of the innovations from your department and of how new equipment or programming can increase productivity.
- Remember that an incentive system can increase both productivity and the department's image.

- Make sure you fully utilize all the edit features of your system.
- Publicize data entry within the company through a newsletter, a bulletin board, memos or a brochure about your services.

"Data entry is a vital part of the organization, and it is about time we received our full share of the recognition," Bodek said.



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OCR Cuts Labor Costs, Boosts Office Efficiency

By Herbert F. Schantz

Special to CW

Today, at least 22% of the U.S. labor force works in offices. The U.S. Department of Labor reports that labor costs are increasing 8% to 10% a year while office productivity has increased only 4% in the last 10 years.

This situation, coupled with the fact that optical character recognition (OCR) equipment costs are decreasing at a rate of 10% to 20% annually, makes today an ideal time to consider upgrading the productivity of the business office.

Both now and in the foreseeable future, data entry will be increasing in cost and volume in a highly labor-intensive user environment where productivity is reaching a plateau.

As the technology of OCR has matured, OCR equipment manufacturers have concentrated on reducing and controlling data entry costs while simultaneously improving information quality. This technology has reduced the time and expense required for data entry while providing increasing control.

The inherent flexibilities of these proven, program-controlled systems readily permit system upgrading — as the users' applications change — at minimum impact to the users' production schedules and operating costs.

Key Areas

During the past 15 years, OCR manufacturers have developed significant product strengths and system capabilities encompassing a number of key areas. I have selected four to discuss:

- **Optical character recognition.** This technology includes the capability of scanners to read readily even badly degraded real-world characters at high speeds.
- **Capability to handle paper reliably.** This paper will range from flimsy carbon-backed airline tickets to very heavy letter mail. Scanning equipment must be capable of handling — on an intermixed basis — a side variety of document sizes and weights that may be folded, spindled or bent.
- **Systems and software integration.** OCR equipment must have the capability to integrate complex multiple processors into efficient systems that include large-scale computers communicating interactively with mini- and microprocessors.
- **Nonimpact printing and micro-filming.** This category of equipment prints human-readable characters or bars — representing data that is to be read by OCR — on documents and microfilms the documents on-line without degrading throughput. This process is effected by projecting droplets

of ink directly onto the paper in a predetermined pattern and microfilming the endorsed document under program control while the paper is in the transport and in motion.

One Example

A large-scale transaction processing system provides an example of how all four of the above technologies are used. A document would pass through such a system in the following manner:

- A document such as a check is fed into the read module where the magnetic ink character recognition (MICR) data line is read both magnetically and optically. The results are fed into a

CPU. Items previously bar-coded can also be read via a bar code reader in this module.

- The document then proceeds to the ink jet printing (IJP) station where ink jet printers spray human-readable and bar-coded numbers. The bar code is checked for readability and validity before proceeding. The document can then be microfilmed and sorted to a specific location according to its disposition under system program control.

This all takes place at a throughput rate of up to 2,400 documents per minute, which at the speed of the transport is equal to approximately 25 miles per hour.

Another use for OCR equipment in

addition to transactional processing is that of the page-printer that replaces the labor-intensive transcription of typed or hand-printed information with a form the computer will accept. This system can readily read original source documents typed in practically any font, reducing the number of key entries required in keypunch, key-to-tape or key-to-disk systems. The system also allows a reading vocabulary to be designed for specific user applications, and it can be upgraded easily.

Key Entry Option

An important enhancement to general transaction OCR data entry systems. (Continued on SR/17)



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Operators Help Choose Hardware Enlisting Data Entry's Support Eases Migration

By Ralph H. Wills
Special to CW

SCHAUMBURG, Ill. — The centralized data entry department should be a dynamic and integral part of the corporation's DP environment. The faster the "raw" data flows through the department, the faster the processed product gets to the hands of the user.

The magic ingredient that ensures a productive, happy data entry department is "involvement." We at Union Oil Co.'s Union 76 Division involved senior operators when we were looking for the "right" data entry equipment. After all, they are the people who will use the equipment when key-

ing the data.

We also involved our user departments in this hardware migration. Through a series of presentations to the users, we communicated to them how the current technology could help do their jobs faster, produce more accurate data and, at the same time, cut down on their manual work.

By taking one user department at a time and looking at every job, we were able to save hours of key entry and manual user effort.

Unique Approach

The data entry department also has taken a unique approach to evaluating various vendors' equipment.

To ensure that the hardware could do the job we wanted done, we ran our own jobs on the equipment before committing our firm to it. Using either our programmers or the vendor's programmer, we got our jobs programmed, and then our lead operators keyed the corresponding data and observed the systems' capabilities.

This helped predefine our needs, from both hardware and software standpoints — validation, edits, in-house programming, balancing and record insertion, for example.

Since 1961, one of our major objectives has been to eliminate keypunching and, at the same time, to improve operators' productivity. We moved to

a key-to-tape system without programming, a minicomputer with no in-house programming, then to key-to-disk with no in-house programming and finally to our current Nixdorf Computer Corp. system with in-house programming.

Today's equipment consists of two stand-alone Nixdorf 480 (formerly Entrex, Inc.) minicomputers running 580 software, 32 switchable keystations based on Entrex Datascope CRT terminals, along with two 1600 tape drives, 66M bytes of disk memory and two 600 line/min printers — all from Nixdorf. This system communicates to a 370/158 host system in the next room.

High Standards

Our data entry staff numbers 38, including supervisors. This department processes 4 million to 5 million records of varying record lengths each month. These records are edited, validated, balanced and/or listed. The input consists of previously stored record files that are updated, keyed records and records from a tape created on the host computer.

After records are edited and validated, the output consists of tape, a listing of material that is transmitted to the host computer over remote lines. We perform this keying at an average rate of 10,000 key strokes per hour.

This rate meets what data entry management — having stand-alone processors with peripheral equipment — considers to be a good standard.

What are the essential ingredients for achieving this average for a data entry department? The answer is simple: a staff of extremely efficient supervisors, training and working with dedicated operators in close conjunction with a trained and skillful programming staff.

Through this training and "state-of-the-art" data entry processing, we have been able to open up career paths that were never available to operators before. These career paths include those for computer operators, programmers for the host computer and jobs in user departments.

The upgrading of the personnel allowed us to migrate over the years and reduce the work force as we have indicated, without having to eliminate or lay off people because of new technology.

Rapport Achieved

By working closely with the user department, we were able to build up an excellent relationship and have become directly involved in any new or changing jobs or applications.

By talking to the user prior to doing the job, we can save time for that user (by reformatting the data from the forms used) and enhance data integrity (by using replacement tables, condition checks, validation, edits and balances).

To say that this entire process has been accomplished without problems would be inaccurate. As the process continues to be refined, however, it has also become more efficient and has proved to be quite workable. Wills is supervisor of data entry at Union 76 Division: Eastern Region, Union Oil Co. of California.

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'Not a Magic Wand'

Expectations for Hand-Held OCR Must Match

By William R. Smith

Special to CW

LOS GATOS, Calif. — Setting realistic expectations for hand-held optical character recognition (OCR) is crucial to a successful OCR data entry application.

With the search on for a

means to cut data entry costs, for some attention has shifted to hand-held OCR as the most promising alternative to key entry. The main reason for this shift has been dramatic advances in microprocessor and memory technology.

To date, more than 90,000

hand-held readers are offered in the \$1,000 to \$2,000 price range. These have been installed mainly in retail and data entry applications.

Let us consider some of the factors that should be considered when setting expectation levels for hand-held OCR data entry.

Rapid Advances

Hand-held OCR first became available in the early '70s. The pioneering effort that established a wand reader as a viable means of data entry involved Recognition Equipment Corp., Singer Co. and Sears Roebuck & Co.

During the mid-70s, the National Retail Merchants Asso-

thusiasm. This led to high market growth projections in both retail and general data entry applications.

In any systems project where expectations exceed the technical capabilities of the available equipment, disappointments are bound to occur. The gap between expectation and results put more pressure on equipment suppliers to improve capabilities. The challenge that faced the industry was to understand the capabilities of the available equipment and attempt to build hardware to meet user expectations.

The results of this maturation process have been significant, with well-characterized

printer and reader products on the market coupled with systems support that fosters realistic expectation levels to be set during system design.

OCR market growth projections for the '80s are strong, according to James R. Williams, president of the NRMA. The installed base of POS wands should increase from 80,000 in use by 300 retailers today to 160,000 in use by 400 retailers by the end of 1981. This represents a delayed growth over earlier projections of the NRMA by about two years.

The delay is a result of several factors, including the excessive enthusiasm of users. With much of the maturation

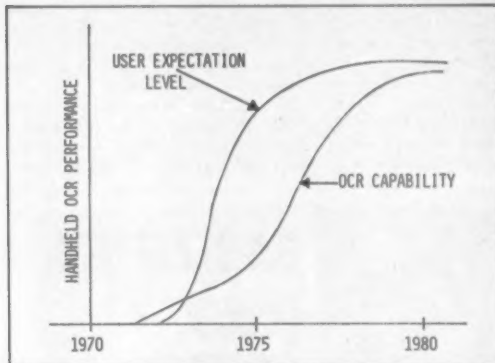


Figure 1. User Expectations for Hand-Held OCR Compared With Actual OCR Capability

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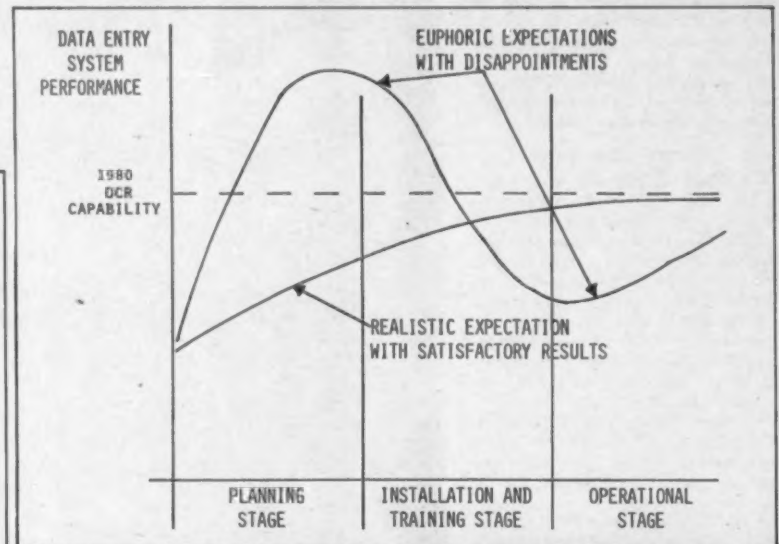


Figure 2. Expectation Levels Compared With Available OCR Technology

ciation (NRMA) selected OCR as the preferred means of point-of-sale (POS) data entry. The NRMA established standards, encouraged printer manufacturers to improve tag quality, encouraged improvements in reader technology with multiple equipment suppliers and developed technical support for retailers.

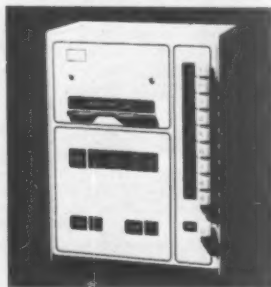
By the late 70s, hand-held OCR began to be used in other data entry applications including factories, libraries, hospitals, remittance processing and government.

Improvements in hand-held readers and OCR printers were rapid during the mid-70s (see Figure 1). This rapid increase in capability, coupled with a need to find alternatives to key entry, promoted high user expectations.

Early OCR demonstrations often involved high-quality media which gave evidence of performance that could not be sustained in practice. Many assumptions were made that led to high projections of usage and to a high level of en-

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process completed and with the use of readers in other areas of data entry, expanding growth rates of 20% to 25% per year can be expected.

Performance Levels

The performance expectation levels of users must be established in line with available OCR capabilities. Project objectives include many factors, from first-time read rate, direct equipment costs, media costs and operator acceptance, to actual labor savings, inventory cost reduction and contributions, to profit.

Two curves are shown (see Figure 2) which represent two extremes in setting OCR objectives. In either case, results cannot exceed the capability available. Disappointments that often accompany euphoric expectations could do permanent harm to the overall data entry project.

OCR is different from other DP projects. Most DP projects involve hardware, software and operations. Hardware and software are developed or acquired during the implementation phase and are relatively stable thereafter.

Medium Is the Key

Key-to-disk data entry operations, for example, involve designing forms, setting procedures and training. The continuing success of data entry is dependent primarily on training and managing personnel.

It is not as easy with OCR projects. In this case, the medium containing the information is the key. Since OCR systems have yet to come close to a human's ability to look at a document and automatically recognize and retrieve the needed information, DP departments often fail to adequately consider the type of medium used.

Factors such as the type of paper used, whether printers are using readable or nonreadable ink, the life of the input medium, the effects of handling on that medium and the general design of the input format all play a crucial role. And many of these factors are often overlooked by the DP department.

Once it is recognized and accepted that OCR readers will not see everything humans can (see Figure 3), it is easier to design a media preparation system with enough quality controls to make the OCR system work satisfactorily in daily use.

In addition to selecting equipment, designing software and setting up operations, the user must understand and design the media system, which will reduce the chance for euphoric expectations that lead to disappointment.

The most successful implementations to date have begun with a good sys-

tems design coupled with an early interaction with an OCR equipment manufacturer.

Smith is vice-president of systems engineering, Caere Corp. He earned a B.S. in electrical engineering from Colorado State University in 1960, an M.S.E.E. at Iowa State University in 1961 and a Ph.D. in E.E. at Iowa State University in 1963. Smith previously served as a research scientist at Fairchild Research and Development Laboratory and in directorial positions in the design, manufacturing and field support for large-scale memory systems, microprocessor testers and other advanced equipment.

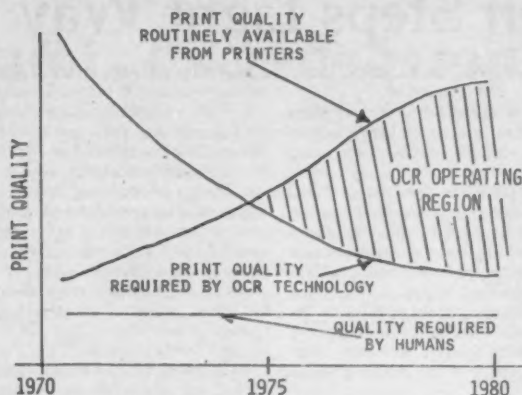


Figure 3. OCR gear requires print quality above that required by humans.



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Ten Steps Light Way to Successful OCR Use

By William R. Smith

Special to CW

I have identified 10 important steps for planning a successful optical character recognition (OCR) data entry system.

1. **Recognize the need for a "total systems design":** It is easy to treat an OCR reader as a terminal accessory and neglect many aspects of the data process. It is also easy to neglect or underestimate the obvious, such as OCR font selection, current and future information formats, field validation, electronic interfaces, software interfaces, operator training and installation.

2. **Establish realistic expectation levels:** It is important to establish realistic expectation levels to avoid some

serious disappointments that can occur when expectations exceed the capability of the available equipment. Hand-held wands are not "magic wands." No machine has come close to the human in reading capability.

3. **Design information formats to fit the natural environment:** Most information formats in use today can be adapted to OCR data entry with little or no change. Standards that are already established and well understood by most personnel should not be changed when converting to OCR unless absolutely necessary.

In designing OCR formats, the following rules and recommendations apply:

- Do not introduce more change than necessary to meet basic OCR re-

quirements.

- Study accuracy requirements and determine if check digits or other data integrity features are required.

- Follow the subfield rule: No valid field format should exist for the application that represents a subset of another allowed field. This restriction is necessary for hand-held OCR since the reader has no way of knowing if the user has wanded only part of a field.

4. **Design human factors to foster self-training:** Good interactive application software walks the operator through the data entry steps with signals, prompts and error messages. With OCR, it is very important to structure the terminal/reader system to foster self-training and proper opera-

tion. The "beeper" becomes an important part of self-training. Sequence control, interlocked data exchange, positive feedback and error recovery need to be well designed.

5. **"Stack the deck" in favor of good media:** It is to be expected that ribbons run out of ink, printers work out of adjustment, equipment will get dirty and media will degrade naturally and during handling.

Because media play a dominant role in read performance, OCR manufacturers offer media evaluation services and have media design manuals. Users who have instituted long-term media awareness and quality control procedures are among those enjoying daily successes with their data operations.

6. **Perform a comprehensive pilot test:** Major software releases are rarely distributed to the full user community without comprehensive testing. The same principle should apply to OCR implementation. Each system factor needs to be "debugged" in a controlled environment. I recommend a comprehensive pilot test be performed before full-scale implementation.

As an example, one user bypassed the pilot test and exposed operators throughout the organization to a system design oversight. The operators quickly became disenchanted with the readers. After the problem was corrected, it took weeks to reestablish confidence and to foster efficient usage of the readers.

7. **Stage the implementation process:** Media conversion alone can be a major aspect of the implementation process. The life cycle of media must be studied to determine when effective wanding will be possible.

In one inventory control application, the average media life was seven months with some media staying in the system for more than three years. Changes to such a system become difficult.

Information format design to accommodate the present while allowing for future expansion is important.

8. **Organize for successful operations:** The organization of the various functions that contribute to the total data entry process plays a key role in long-range effectiveness. Prior to OCR, the media preparation department could be organizationally remote from the data entry department. With read efficiency tied to print quality and operator training, it becomes important to have printer quality assurance and training under the influence of the department chartered to ensure long-term results using OCR data entry.

9. **Train and motivate for success:** Some OCR training takes as little as 15 minutes, and it is often easy to take for granted. During the recent tour of a store that had skipped the training program, only 10 out of 25 operators were receiving satisfactory read results. The others started out improperly, became discouraged and quickly developed a negative attitude towards wanding. After a short training session and some motivational inputs from a manager, the results improved dramatically.

10. **Establish a continuing performance review:** A program to review performance regularly has proven to be the most effective means of ensuring good long-term data entry performance.



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CW 43880

CONSOLIDATED COMPUTER INTERNATIONAL INC.

New Career Paths Needed

Demand for Skilled Operators Exceeds Supply

By Beverly E. Christensen

Special to CW

NEWPORT BEACH, Calif. — The need for people who can operate data entry equipment continues to grow, especially in the insurance industry, but not enough people are entering the field to satisfy industry requirements.

Centralized data entry operations are still common in many insurance companies, although in recent years there has been a discernable trend away from the centralized data center and data entry section. Many people who are skilled in keying data are looking toward opportunities and career paths not offered by centralized operations.

It is difficult to predict what life is left in centralized data entry. The obituary for keypunch machines was written long ago, and we wait for the day of decentralization and the equipment associated with it.

But keypunch and key-to-disk equipment continue to be the work horses of data entry in spite of their predicted demise, frequently continuing long after their newer cousins have been turned off and left for the night.

Career Paths

Creating opportunities and career paths that will attract and help retain a sufficient staff of highly skilled, qualified production operators is becoming a challenge; many companies have simply given up this effort. But is it possible to build career paths within and out of the data entry department?

Establishing titles such as trainee and junior and senior operators, as well as salary ranges to go along with them, is an important start. Incentive or bonus plans, offered on a regular basis, are ways to satisfy operators who enjoy keying but need a higher degree of motivation than the promise of an annual salary increase.

Receiving, sorting, counting, properly identifying batches of work, and the important task of balancing fluctuating volumes of work to available resources between user and data center requirements are all essential to the data entry function.

Cross-training in the various support functions required in a data entry section provides adequate backup for these functions, as well as a supplement to keying responsibilities.

Another support function is statistical record keeping. This can range from keeping very simple to rather elaborate statistics. An important part of a successful data entry operation requires an accurate measurement of operator, equipment and software performance in terms of production output, efficiency and total cost.

Range of Skills

The advent of key to disk systems opened up needs for a broad span of specialized computer-related skills. Many people in the data processing industry do not realize or recognize how many skills are developed and utilized in the key-to-disk entry operation.

At Pacific Mutual Life Insurance Co., for instance, the Univac 1900 computer-assisted data entry (Cade) key-to-disk system's user software consists of check box and modified Cobol programming. One hundred and forty-eight programs, containing

up to 32 levels each, are currently being used, with more being added all the time. This requires operators to learn some basic programmer skills, including program logic, program structure, systems analysis and supplementing programmer specifications and documentation with its own coding, keying, compiling, testing and debugging.

A data entry operator also wears the hat of a computer operator. Task-related supervisor commands to the key-to-disk processor encompass a range of activities similar to those of a mainframe computer operator. Proper identification and handling of system errors is a must, with the operator sometimes being a pseudo-customer

engineer.

Other aspects of data processing are necessary in the key-to-disk environment, such as maintaining the tape library, scheduling and providing technical support. Meeting the operational requirements of a key-to-disk system develops talents and skills which in turn provides a good springboard for data entry personnel to go into careers as programmers.

Document Microfilming

Source document microfilming opens up another career path. Pacific Mutual's data entry section took over this responsibility several years ago. Good data entry operators already

have many of the skills and habits needed to make a good microfilm operator.

The manner in which people in data entry regard themselves is changing. The realization that we are indeed professionals with a vital service to offer has been slow in coming. Much of the effort towards promoting this professionalism is through the establishment of the Data Entry Management Association. This type of organization gives data entry professionals an advantage many other professions have had for years.

Christensen is Pacific Mutual Life Insurance Co.'s supervisor for Data Conversion.

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To Oversee City Spending New York Fisa First U.S. User of 3033N

By Marguerite Zientara
CW Staff

NEW YORK — New York City's Financial Information Services Agency (Fisa) — whose job it is to see that dollar balances will cover checks drawn by municipal departments — has become the first U.S. user of IBM's 3033 Model Group N Processor.

As a purchase replacement for a leased 3032, the 3033N — with eight million bytes of information storage — is being used initially to develop and test new programs and services, as well as for maintenance and "nonregular" production work, according to Fisa Executive Director David G. Woodbridge.

Fisa, an arm of New York's Integrated Financial Management System, has been managing the operating portion of the city's \$13 billion budget since June 1977. That includes day-to-day expenses for more than 1,200 departments involving nearly 200,000 transactions per week and almost a quarter-million paychecks.

Fisa's staff and computers help assure that city agencies do not write checks unless there is cash in the till. But there is more to Fisa than just controlling city agencies' spending.

Restoring Confidence

By producing sophisticated financial planning information, the agency has helped restore confidence in New York's financial integrity. In a single year, for example, Fisa "discovered" \$26 million worth of reserve funds in the municipal budget.

Now Fisa is taking over the city's \$1 billion capital budget, grants management and fixed-asset programs, extending its automated services to cover New York's long-term expenditures and crucial revenue resources. Such projects, implemented in "the last few months," according to Woodbridge, will not actually be processed on the 3033N, but rather on the group's production machine, a 3033U.

"However, we expect to have heavy maintenance type support on the 3033N in the first few months of operation because they're new projects and we're shaking the bugs out of them," he said.

'One Hard Hit'

Claiming the 3033N's performance has been "phenomenal," Woodbridge noted the only major problem encountered came five

weeks after its installation in late January.

"We had one hard hit, and it wasn't so hard that we had to stop processing, but it happened on the graveyard shift early Monday morning, and some of my people turned it over to IBM to get it fixed."

"It was the type of problem they could have lived with until the following weekend," he noted, adding, "Yes, there have been problems, but they've been problems we've taken care of on the weekends."

When asked if he felt any apprehension about being the first user of the 3033N, Woodbridge replied, "Not really, because I didn't regard this as a new machine; I really regarded it as an option feature, if you will, on a 3033." And since Fisa's 3033U already had a "phenomenally good record," Woodbridge was confident there would be no seri-

ous problems.

Besides the 3033N and the 3033U, Fisa's installation includes 112 Model 3350 disk drives, 24 Model 3420 disk drives, 16 Model 3330 disk drives and "various printing devices," Woodbridge said. The shop is "not quite, but nearly all-IBM, except for a lot of equipment on our information network and some other minor equipment."

However, "like everybody else, I think we're waiting to see what the seemingly almost mythical H series announcement will mean to us," he added. "And I expect, in connection with that, there'll be a new family of tape and disk drives announced."

"Really, until there's a major change in the hardware technology which will offer us significant benefits, I see no major changes coming."

Microfilm Retrieval System Stores 3.5 Billion Characters

NEWPORT BEACH, Calif. — A microfilm retrieval system that can store from 56 million to 3.5 billion characters of information and retrieve cross-referenced data is available from Bell & Howell's COM Products Division.

The vendor is targeting its Excalibur Management System to organizations that need to access large amounts of data. Typical applications include processing insurance claims, credit applications and invoices.

Priced at \$98,500, the basic system consists of a Digital Equipment Corp. PDP 11/40 with 128K bytes of memory, two 28M-byte disk drives, one CRT terminal, a 16mm data entry camera and software.

English Messages

Excalibur uses plain English messages to guide operators through the entry and retrieval process. Information is filmed at the same time the retrieval index is created by the computer, eliminating any possibility that the two might be separated, Bell & Howell claimed.

A modular design is said to allow the system's capability to be expanded to support up to 12 entry/retrieval stations so different using departments can concurrently run different applications. By adding disk drives, Excalibur can provide up to 3.5 bil-

lion characters of on-line storage.

Bell & Howell's COM Products Division is at 1451 Quail St., Newport Beach, Calif. 92660.

Ling to Keynote IMC '80 Meeting

ST. PAUL, Minn. — Dr. Joseph T. Ling, vice-president of environmental engineering and pollution control for 3M Co., will be the keynote speaker at the International Micrographics Congress (IMC) conference to be held in Hong Kong on September 15-19.

"Manufacturers and users of micrographics who prepare now to meet the [environmental] regulations will minimize costly adjustment problems later," Ling said in discussing his upcoming speech.

Two types of preparation will be explored. First is the necessity of following the development of key environmental regulations. Second, the need to develop innovative technology aimed at reducing or eliminating pollution at the source will be stressed.

Registration fee for the meeting is \$350. Additional information can be obtained from the IMC Executive Secretary, P.O. Box 22440, San Diego, Calif. 92122.

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data consistency checks; Data Mapping controls data conversion and formatting; and Transaction Control covers application and transaction flow. Each resource is partitioned, with well-defined interfaces between them. This is the secret to a modular systems' success. It allows optimized utilization of all the resources and permits additional resources to be dovetailed into the system as needed—without rewrite, without redesign and without degrading system performance.

We Speak Your Language. When it's time for the fifth operation—interaction with the data base—a Data Base Application Program can communicate in any of the languages available on the Tandem NonStop™ System: industry standard COBOL, FORTRAN, MUMPS, or our own transaction-oriented language, TAL, all facilitated by Tandem ENSCRIBE to interact with the Data Base management capabilities.

The Things You Can Forget. The PATHWAY Transaction Processing System capabilities include an Interactive Screen Builder which builds and tests screens interactively at a terminal, independent of the application

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TERMINAL
INTERFACE

program which serves it; a Screen COBOL Pseudo Code Compiler; a Terminal Control

PATHWAY
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check the flow and content internally; the Applications Monitor which has power to create, track and alter the application run time environment; and finally the Application Monitor Control Language which lets an operator communicate with an active Application Monitor. It's a powerful system, easy to use and inexpensive. With everything you need to get your on-line transaction applications up and running, with all the benefits of a NonStop™ System, in record time.

Dynamic Load Balancing. It comes from taking logical advantage of the multi-processor environment. There is no need for the programmer to consider load balancing with the PATHWAY Transaction Processing System. It's handled automatically; with additional copies of PATHWAY applications started in designated CPUs as needed. And deleted when no longer required. Dynamic load balancing—built into the system's resource management capabilities.

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Because terminal mapping translates physical into logical characteristics, programmers can forget about code signal conversions and call on terminals by name. And there's one more major advantage of the PATHWAY Transaction Processing System: one

system can be used for convenient development, testing and production of application packages.

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Pen Plotter Unveiled

MT. SHASTA, Calif. — A multifunctional digital pen plotter has been introduced by Mauro Engineering here.

The MP-250 Proac pen plotter plots at a maximum speed of 2.5 in./sec with .005-in. resolution. The device handles paper in dimensions of either 8.5 in. by 11 in. or 11 in. by 17 in.

The standard MP-250 uses one parallel output port and includes vector driver software for 8080, 6502 and 6800 microprocessors. Interfaces are also available for serial data ports and Radio Shack TRS-80 and Apple Computer, Inc. microcomputers.

The unit costs \$650 from Mauro Engineering, Rt. 1, Mt. Shasta, Calif. 96067.

MPU-Based Sonic Digitizer Debuts

SOUTHPORT, Conn. — Science Accessories Corp. has added a microprocessor-based sonic digitizer to its Graf/Pen GP-Series 6 family.

The Model GP-6-30, incorporating a microprocessor and related firmware, provides origin offset, incremental mode and alphanumeric Ascii menu capability, according to a company spokesman.

Origin offset reportedly allows the arbitrary establishment of an origin anywhere on a plane; incremental mode allows elimination of redundant data; and menu capability provides simultaneous alphanumeric data entry.

Digital display is in BCD Cartesian (X,Y) coordinates, and output compatible with RS-232, HP-IB or IEEE

488-1975 is available. Environmental temperature compensation is built-in.

Stylus or Cursor

Points on the plane to be digitized, which may measure up to 60 in. by 72 in., are located with a manually oriented stylus or cursor.

Designed to convert positional information into digital coordinates "conveniently and economically" in one or two dimensions, the GP-6-30 produces digital values in a form suitable for display, DP, storage or transmission.

The incorporation of the microprocessor allows automatic mathematical computations previously requiring external processors or hand calculations, the spokesman claimed.

The GP-6-30 sells for \$3,555 with quantity discounts available. Delivery is in four weeks from 970 Kings Highway West, Southport, Conn. 06490.

Three-Day Meet On Graphics Set for Chicago

NEW YORK — A three-day seminar on the use of computer graphics is being sponsored by Frost & Sullivan, Inc.

Sessions will be held in Chicago June 10-12 and in Toronto on Sept. 23-25. Topics will include an overview of the hardware and software systems available and cost-justification for installing computer graphics.

Carl Machover, president of Machover Associates Corp., a consulting firm, will keynote the meeting.

Seminar sessions are from 9:00 a.m. to 12:30 p.m. and 1:45 p.m. to 5:00 p.m. each day. Registration fees, which include all handout material, are \$545 per person and \$495 for each additional attendee from the same company.

More information may be obtained from Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

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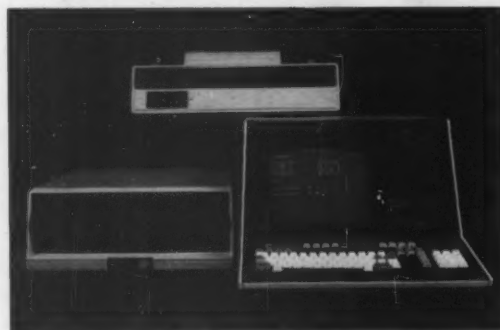
Your terminal can't be an island unto itself. It has to communicate with something, somewhere. In addition to the terminal's flexibility and power, you should consider how well it's going to perform within your whole communications network.

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A modular hardware design permits the CDX-68 to range in configuration from passive display terminals to stand-alone systems to sophisticated networks for distributed processing applications (with up to 56K bytes of user memory and up to 40 Mb of on-line data storage, as well as

a variety of printers). An extensive array of software includes ANSI 74 COBOL, BASIC, FORTRAN, MPL, a macroassembler and the CODOS Disk Operating System. Communications can take place using a variety of protocols, including 2780, 3780, HASP Multileaving, and asynchronous disciplines.



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Forms Feeder Debuts

MOHAWK, N.Y. — Advanced Terminals, Inc. has announced the addition of the Model 5000 forms feeder to its product line.

Microprocessor-controlled, the Model 5000 utilizes cartridges for loading and can handle multiple sheets, envelopes and continuous forms, as well as acting as a printer sound enclosure, a company spokesman said.

Designed for compatibility with Qume Corp., Diablo Systems, Inc. and NEC Information Systems, Inc. printers, the Model 5000 will be marketed initially to the OEM market at a single unit price of \$3,200.

The unit will be available in the fourth quarter from Advanced Terminals, Inc., Fort Herkimer Road, RD 2, Box 80, Mohawk, N.Y. 13407.

For Computer Room CPC Offers Power System

COLUMBUS, Ohio — Conditioned Power Corp. (CPC), a newly formed subsidiary of the Liebert Corp., has announced the Power Management Center (PMC) as its entry into the computer room power systems arena.

While CPC admits that the system does not provide protection against a total extended power outage — some-

thing which can be given by an uninterruptable power source/diesel generator installation — it claimed that the PMC does handle common and normal mode line noise and out-of-specification voltage power disturbances.

The modular PMC utilizes coded flexible cables rather than a hard-wired conduit system for power distribution

within the computer room.

The complete package includes an alarm system to signal if power exceeds normal operating limits and an output monitor to scan system performance and provide a warning of prolonged voltage fluctuations.

Optional equipment includes bolt-in circuit breakers, remote emergency power shutdown and a phase rotation meter.

CPC quoted a price range of \$30,000 for installing its PMC with 100 kVA capacity.

Additional information can be obtained from Conditioned Power Corp., 6700 Huntley Road, P.O. Box 29039, Columbus, Ohio 43229.

Trilog Unveils NCR-Compatible Printer/Plotter

IRVINE, Calif. — Trilog, Inc. here has introduced a dot matrix printer/plotter system compatible with the NCR Corp. 8200 minicomputer.

The T-8200 system provides a 96-char. upper- and lower-case Ascii set at 300 line/min for line printer operation.

"The NCR 6420 Band Printer operates at the same speed with 48 upper-case characters — with 96 characters, its speed is halved to 150 line/min," Ray Melissa, vice-president of marketing, claimed.

Standard features of the T-8200 include a static eliminator and switches to select form length and perform self-testing on the printer.

The system, which is based on the Printronix, Inc. P300 printer/plotter, has a choice of 10-, 13- or 16 char./in. at either 6- or 8 line/in. as an option. It plots with a dot density of 60- by 72 dot/in. at 33 in./min.

Software-selectable business applications include graphs, bar code symbols and labels.

The T-8200 costs \$7,630 with a one-year limited warranty. Current availability is 30 to 60 days from Trilog, Inc., 17391 Murphy Ave., Irvine, Calif. 92714.

From the graphics leader.

Tektronix announces its week-long workshops on 4020 and 4050 Series graphics.



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The workshops teach standard as well as optional features, with emphasis on graphing and high-resolution graphics, peripherals and software.

Mark your calendar. Workshops open for enrollment are listed below; five days, \$600.00 fee.

Contact Tektronix to register now. To assure individual attention, we've limited enrollment to 12 in each class. You can reserve your space today by calling the IDD Training Registrar collect at (503) 642-8951. Or mail the coupon to:

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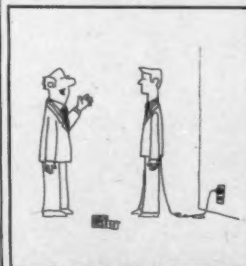
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211	Rockville, MD	July 21-25, 1980
212	Santa Clara, CA	Aug. 11-15, 1980
213	Rockville, MD	Sept. 29-Oct. 3, 1980
214	Santa Clara, CA	Nov. 3-7, 1980

4050 Series Operator Workshops

125	Santa Clara, CA	June 9-13
126	Rockville, MD	June 16-20
127	Rockville, MD	Aug. 4-8
128	Rockville, MD	Aug. 18-22
129	Santa Clara, CA	Sept. 8-12
130	Santa Clara, CA	Sept. 22-26
131	Santa Clara, CA	Oct. 6-10
132	Rockville, MD	Oct. 13-17
133	Santa Clara, CA	Oct. 20-24
134	Rockville, MD	Oct. 27-31



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PERKIN-ELMER

Audit System Gives Retailer Happy Holidays

Special to CW
DENVER — Without an up-to-date sales audit, a department store cannot know what it actually sold on a given day. That is why Denver Dry Goods here was upset in the 1977 Christmas period. Sales audit transactions — almost 1.4 million a month in December — were more than nine days behind.

Christmas 1978 was different for this department store, a division of the \$1.5 billion Associated Dry Goods Corp. (ADG) chain. Sales audit transactions were right on schedule.

The reason: Denver Dry Goods was the site of one of three 1978 ADG pilot installations of on-line data entry using IBM 3760 dual key entry CRT terminal stations. In a move to standardize, the 16-store chain installed 3760s at Denver Dry Goods, Hane & Co. in Newark, N.J., and Powers Dry Goods in Minneapolis.

Elements of IBM's 3790 communication system, the 3760s are linked to a 370/158 regional host functioning under IBM's Systems Network Architecture (SNA).

The pilot system required

fewer keystrokes than the same tasks performed on key-to-disk equipment. Further, it cut retransmissions of data to and from host computers, reduced the error rate from more than 20% to 3% and eliminated the need for magnetic tape handling. In addition, the firm has reportedly managed to make transactions for sales audit and a variety of other data entry transactions fully current.

Steps Toward Control

The network has helped standardize a long list of applications across the spectrum of department stores it serves. It has been working for about three years to standardize them in order to beat back rising costs and increased competition, according to Michael McLaughlin, corporate director of information system planning.

"We are a combination of prestige stores — with names like Lord & Taylor, Joseph Horne & Co. in Pittsburgh Pa., and Stix, Baer & Fuller in St. Louis," McLaughlin said. "Each store has its own way of doing things, despite the regionalization of computers. To interpolate division results across the board, we need more overall corporation control. The SNA network and standardized data entry are the first steps to such control," he said.

ADG currently has 370/158 regional computers in Piscataway, N.J., Clayton, Mo. and Los Angeles. Except for Lord & Taylor, which has its own 370/148, each store funnels its DP to the regional centers.

"SNA gave us not only a common interface and IBM support, but also the full-duplex capability we needed. Two-way transmission of data was essential. While printing hard-copy reports at Goldwater's in Phoenix or Hengerer's in Buffalo, N.Y., we could be transmitting data back from the stores at the same time. It is a more effective use of equipment and communications lines," McLaughlin noted.

The next move was to standardize data entry. Each store had its own data entry equipment, usually key-to-disk. The IBM 3760 dual key entry system provided on-line data entry under SNA.

Pilot Installations

Plans were made to install the three pilot installations in 1978 to prove the viability of on-line data entry with the 3760/3790 before an all-out conversion.

To prepare for the pilots, ADG coded and tested all input formats for the three stores on an application-by-application basis.

The first installation was

made at Hahne in October 1978, and Denver and Powers followed. Now each is using 3760s for 12 on-line data entry applications, from sales audit and accounts receivable to payroll, payables, retail price changes and transfers.

Monthly application volumes range from the peak of 1.4 million sales audit transactions at Denver to a few hundred merchandise plan entries at Hahne. Denver Dry Goods has installed 18 3760s; Hahne and Powers have 16 and 12, respectively.

Each 3760 terminal is connected via a cable to a 3791 controller, one per installation. The 3791s are linked by leased communications lines to the 370/158s in Piscataway, Clayton or Los Angeles. Each controller performs nearly all editing on the data, including cross-footing, batch balancing, check-digit verification, table lookup and other checks.

Increased productivity and standardization are the major benefits of the data entry system. The 3760s require fewer keystrokes and less handling while generating fewer errors. And they all function the same way, according to ADG.

"It's really nontechnical data entry," according to Barbara Bonetti, manager of data entry systems implementation. "Editing capabilities are built into the formatting, saving keystrokes." Another benefit is the elimination of tape handling. All data entry is

now in effect on-line.

"Tape handling required a full-time person before to remove the reel and hand-carry it to the computer room. The key-to-disk equipment had to be shut down. Everyone stopped keying when the disk was full. Now there are no such lockups," according to Fred Butler, data communications manager.

Added disk space is a by-product of shifting to the 3760/3790 configuration, Butler said. ADG now has enough disk capacity to keep at least three days' sales audit on-line instead of one.

In addition, the new configuration requires about 10% fewer keystrokes than the key-to-disk equipment it replaced, he added.

"With common systems, we can interpret the results of different divisions and see what is really happening out there. It helps us react quickly to changing competitive situations," he added.

ADG finished installing 3760 and 3790 configurations in all of its 16 stores by Nov. 1, 1979, in time for the Christmas season. Eventually the department store chain plans to order an IBM 3762 remittance processor configuration of the 3790 to handle turnaround documents like customer bills.

Ultimately, it said, it will have fully standardized data entry for all stores — plus just about all bread-and-butter applications as well.



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DDP Aiding Remodeling of Boeing 747 Building

RENTON, Wash. — Major additions and extensions are being made to what is reportedly the largest volume building in the world — Boeing Co.'s 747 Final Assembly Building in Everett, Wash. — with the help of a distributed processing network supported by Hewlett-Packard Co. hardware and software.

The Austin Co. first constructed the building approximately 10 years ago. It is being enlarged to make it suitable for Boeing's 767 program. Current building specifications state that it is approximately 341,645,000 cubic ft in volume.

Austin is a decentralized organization with 24 divisions located in the U.S. and other countries. It claims to have put in place more than \$1 billion in construction projects within the last year.

Systems Evaluated

Austin converted from manual to computer systems based upon a study it did in 1976. When a decision was made to install an on-line system, the company performed a three-month evaluation cycle involving Prime Computer, Inc., HP, IBM, Data General Corp., Digital Equipment Corp. and System Engineering Laboratories, Inc. equipment.

"Our principal reasons for going with Hewlett-Packard were its worldwide support and the superiority of its software, particularly in the area of communications and data base," Jan Polhemus, manager of business systems, said.

In January 1977, Austin installed an HP 3000 Series II as a development system in its Roselle, N.J., office. It moved the computer to Chicago later that year to bring its first applications on-line.

The cost control application is used mainly in the field on projects like the Boeing building. Personnel enter labor costs, material costs, purchase orders and change orders on HP 2645 terminals housed in on-site construction trailers. These transactions update the data base.

At the end of each day, a field accountant reviews the new information and compares it to the original estimate. If potential problems are spotted, the appropriate managers are notified so that they can monitor the project on an hourly basis, if necessary.

"Projects typically last only about eight months or so," Polhemus said, "and there used to be a 30-day cycle on spotting them. By the time we found out we were in trouble, we were frequently beyond the point of being able to do anything about it."

System Upgrades

Because of the growing interest of their other divisions in the capabilities of the system, the company formed the Austin Information Systems Division (AIS) to implement a distributed processing system on a worldwide basis.

In May 1978, the company upgraded the HP 3000 in Chicago from 192K bytes to 512K bytes and installed a second 512K-byte HP 3000 in Renton. In September of the same year, it installed an HP 3000 in Roselle.

During 1979, all three systems were upgraded again to the HP 3000 Series

III with 1M- to 2M bytes of memory. "We just bought two more of the HP 3000s and are installing them this month," Polhemus noted.

The current network ties together approximately 200 HP 2645 and HP 2635 terminals in seven locations. Each mainframe configuration includes two HP 1600 bit/sec tape drives, more than 100M bytes of storage on HP 7905 and HP 7920 disks and one printer.

The DS 3000 communications software provides access to all printer/plotters and a California Computer Products, Inc. 1055 drum plotter. Word processing is handled by three DEC PDP-11/34 minicomputers.

The network is now controlled entirely through software. A future project may include the installation of a network controller. "DS 3000 will then be used for true distributed tasks — remote device and file access, and processor-to-processor applications," Polhemus said.

For large-scale engineering applications requiring heavy number crunching, a dedicated 9,600 bit/sec link is provided from the Chicago HP 3000 to the McDonnell-Douglas McAuto network with an IBM 370/195 complex.

Another link is set up from the Renton mainframe to a Control Data Corp. 6600 at Multiple Access Computer Group in Toronto.



Diane Taylor, Austin's project leader, uses graphics workstation.



Data Entry Good News for Houston Chronicle

By Rosa L. Miller

Special to CW

HOUSTON — The Data Entry Department is playing a very important part in the rapid growth of the *Houston Chronicle*, where current circulation numbers about 170,000. Strict deadlines must be met in order to produce daily reports.

These reports are essential for the entire newspaper, from laying out the pages to sending numbers of copies to each newspaper distributor.

Each department submits different source documents to be entered into the system on a daily basis. Other documents are accumulated until the end of the month for monthly billing.

As historical background, it is worth noting that the paper changed its data

entry system — and its efficiency — when it converted from a keypunch department to a key-to-disk batch entry system in 1975. Within two months, the volume of work being done here had increased immensely.

'Tremendous Growth'

In 1977, the Classified Advertising Department began reaching record highs in document data entry, and there has been a steady increase from that time.

Today, the *Houston Chronicle* carries the highest classified advertising lineage in the nation, totaling more than 66 million lines in 1979. This increase was accompanied by a tremendous growth in each department.

Data entry now keys between 1,500

and 3,000 classified ads each day for the next day's paper. These ads must be merged with corrections for billing, "kills" for expired ads and money received for payments. All are balanced and completed early in the evening.

If this deadline is not met, the Data Entry Department runs the risk of causing the Composing Department to be late in setting up the newspaper, which in turn can cause a reaction that will snowball all the way to delays in delivering the *Chronicle* to its customers.

Reports for Management

The growth experienced by the paper's data entry system does not stop with classified ads. Other advertising departments — such as retail and

national — are also increasing, and their advertising documents are handled differently from the classified documents. They are sent to data entry after the paper has been published. Advertisers are billed on a monthly basis.

Some reports, however, are produced on a daily basis from the documents. These reports enable management to see how the lineage compares with that of the previous year and also with the lineage of the *Chronicle's* competitor, the *Houston Post*. At the end of the month, reports from this information are used to generate sales staff bonuses and also information on where they must improve in the following month.

Other Reports

The Circulation Department, for paid-in-advance subscribers, is now the only department directly on-line to the mainframe. Other work for circulation is sent through the Data Entry Department, and other daily and monthly reports result.

Daily reports provide information to the circulation transportation dock about the number of papers being sent to each distributor. Monthly reports provide debit and credit billing both to the distributor and the Accounting Department.

The Accounting Department itself is also set up to provide reports on a daily and monthly basis. Data Entry keys from source documents to provide checks daily for our accounts. At the end of the month, journals are keyed in for financial reports. Budget documents are sent in once a year. These include expense, payroll and lineage budgets. Because of the amount of newsprint needed, estimates must be made by each advertising department of the amount of lineage to be run daily for the year. These estimates are important because they ensure the *Chronicle's* having enough newsprint available for the quantity of papers to be printed.

Future Data Entry

Houston is one of the fastest growing cities in the nation and the *Chronicle* looks forward to continued rapid growth. To meet all the demands of the different departments, data entry will have to continue growing.

Instead of growing within the DP department, other departments will enter data through their own data entry systems.

The Classified Department will be one of the first to take charge of its own data entry. This system will have to be large enough to handle as many as 260 terminals, some in remote areas. This plan is now in the process of being reviewed at the *Chronicle*.

What does such reorganization mean for personnel within the Data Entry Department? Not loss of positions, but instead increased opportunities for advancement for each person.

Positions will open in each system in training and also in analysis. Employees will have more flexibility to move to their favorite department or possibly even to an area closer to home.

Advertising is essential for most companies to grow. Since newspapers are one of the best means of advertising, the *Chronicle's* data entry can look forward to a very promising future.

Miller is manager of data entry and control at the *Houston Chronicle*.

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Check out our Boston conference schedule:

May 6th Conference (Exhibit hours: 10:00-5:00)

D-1 8:45-10:00 EXECUTIVE BRIEFING: INFORMATION SYSTEMS PLANNING John M. Lusa, Executive Editor, *Infosystems Magazine*, and William R. Synott, Senior Vice President, First National Bank of Boston.

D-2 10:00-11:00 BUILDING EDP AND TELCOM SKILLS FOR THE 1980's Larry Grodman, President of Q.E.D. Information Sciences, will lead a panel of users and educators.

O-1 11:45-12:45 HOW WORD PROCESSING CAN BREAK THE OFFICE PAPERWORK BOTTLENECK

O-2 11:45-12:45 HOW TO CUT COMMUNICATION COSTS This session will describe how to use communication management tools. Fred Chanowski, President, Telecommunications Management Corp., Wellesley, will make this presentation.

M-1 1:30-2:30 AUTOMATION FOR PLANT PRODUCTION AND TESTING APPLICATIONS

F-1 1:30-2:30 SPECIAL PRESENTATION ON MICRO-GRAPHICS APPLICATIONS The National Micrographics Association has arranged special micrographics and microfilm sessions for EXPO '80. Boston area speakers include Mark Robinson, Raytheon Corp., Lexington, and Paul Duquette, Middlesex Insurance Company, Concord.

D-3 3:30-4:30 COMPUTER GRAPHICS: NEW WAYS TO VISUALIZE COMPUTER INFORMATION FOR BUSINESS, ENGINEERING AND RESEARCH USERS John Clauson, graphics specialist at Hewlett-Packard in Bedford, will bring you up to date on new graphics uses.

M-2 3:30-4:30 OPTIMIZE MANUFACTURING PRODUCTIVITY VIA SMALL AND LARGE COMPUTER APPLICATIONS

May 7th Conference (Exhibit hours: 10:00-7:30)

O-3 6:45-9:45 COMBINED WORD AND DATA PROCESSING Charles I. Norris, Manager, International Data Corporation's research program on Automated Business Communication, and Mrs. Willoughby Ann Walsche, Exec. Ed. of *Word Processing Systems*, will speak.

D-4 10:00-11:00 DATA BASE OPPORTUNITIES IN CENTRALIZED AND DISTRIBUTED SYSTEMS John Burton, New England Regional Manager for Cullinane, will head the session.

D-5 11:45-12:45 DISTRIBUTED PROCESSING: USER UPDATE ON THIRD GENERATION EXPERIENCES Ronald A. Frank, writer and analyst of data communications issues, will chair a panel on advanced distributed processing. Joining him will be Nathan A. Teichholtz, Dir. of Software Development & Planning at Prime Computer, and others.

D-6 1:30-2:30 FINANCIAL AND MANAGEMENT TECHNIQUES USING EDP TOOLS Robert Glatz, staff member at Deloitte, Haskins and Sells, Boston, will show how EDP and financial professionals can use these new applications.

D-7 3:30-4:30 SMALL AND DESKTOP COMPUTERS FOR PROFESSIONAL AND BUSINESS APPLICATIONS How can small computers solve big managerial and technical problems? Mary Anne Driscoll, President of Small Systems Research Group, Dunstable, is panel chairwoman.

O-4 3:30-4:30 LINKING WORD PROCESSING AND PHOTOTYPESETTING TO CUT REPROGRAPHICS COST Ted Magida, President,

Tower Associates, Needham, will give an overview.

May 8th Conference (Exhibit hours: 10:00-5:00)

D-8 8:45-9:45 ENHANCING SOFTWARE APPLICATION PRODUCTIVITY FOR END USERS William E. Zachmann, Research Director, IDC's Information Systems Planning Service, will discuss how users are addressing the productivity problem and potential solutions.

O-5 10:00-11:00 HOW TO USE COMPUTERIZED TELEPHONE SYSTEMS Fred Chanowski, President, Telecommunications Management will discuss how mini-computer-based telecom control systems are saving costs and opening up new uses in systems management and electronic mail.

D-6 11:30-12:30 INTEGRATED INFORMATION SYSTEMS: "POSITIONING FOR THE 1980's" J. Thomas Markley, President, Raytheon Data Systems, will present this special executive briefing.

S-1 1:30-2:30 SMALL COMPUTERS FOR MARKETING AND DISTRIBUTION APPLICATIONS A management panel will discuss how to maximize productivity via marketing information systems.

D-9 3:30-4:30 HOW TO SELECT SMALL SYSTEMS FOR ON-SITE AND DISTRIBUTED APPLICATIONS Chairman is Lawrence Feidelman, President of Management Information Corporation and editor of *Small Business Computer News* and *Packaged Software Reports*. He will cover small systems applications for both first time users and new sites for DDP in large companies.

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Vying With IBM 5120

Wang Adds System Trio to 2200 Family

LOWELL, Mass. — Attempting to tighten its grip on the small business system market, Wang Laboratories, Inc. has announced three system enhancements to its 2200 family of computers — two at the low end and another in the mid-range.

Wang expects the systems to match or exceed the price/performance of the IBM 5120 desktop computer, announced in February, and thus set the stage for a long-term competitive struggle between the two companies in the \$10,000 to \$35,000 small systems arena.

The low-end 2200 SVP and mid-range 2200 LVP will form "the cornerstone of the 2200 family for the next five years," according to Sam Gagliano, director of small business systems.

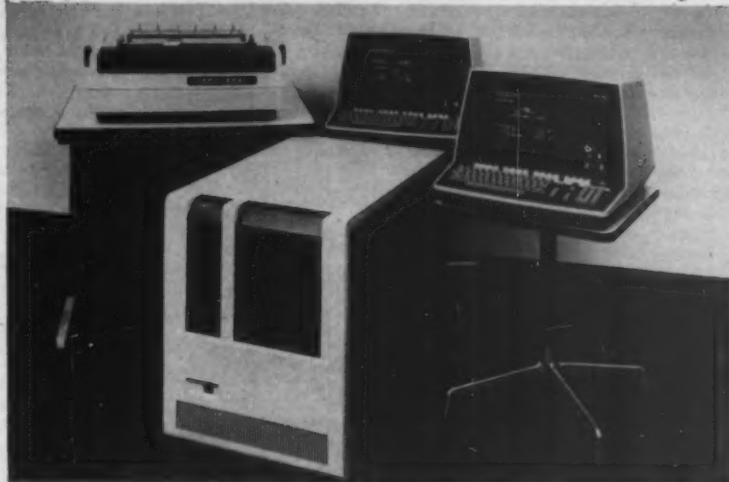
The low-end PCS-III programmable desktop system is aimed at first-time computer users.

The additions were characterized as "second-generation" systems for single, multiple and first-time users in small businesses with annual revenues between \$3 million and \$25 million, a market Wang says is growing 25%/year.

Single User Version

The 2200 SVP is the single-user version. A basic configuration includes 32K bytes of memory, a Wang 2236 high-resolution terminal with 12-in. diagonal screen, a 120 char./sec Wang matrix printer and 500K bytes of single-sided, double-density floppy disk storage.

Programmable in Wang Basic-II, the system has block, character and line graphics capability, includes a small general library of software products and reportedly supports full asynchronous and bisynchronous tele-



The Wang 2200 LVP

communications protocols. The basic version sells for \$11,000.

Options for the 2200 SVP include 64K bytes of user memory, a second 500K-byte single-sided, double-density floppy disk or the addition of a 2M- or 4M-byte Shugart Associates 8-in. sealed fixed-disk drive — the first time a manufacturer has incorporated this drive in volume quantities, Wang said.

Other options for the 2200 SVP are a word processing software package available from Wang's 700 licensed vendors and a comprehensive library of utility programs available for approximately \$500.

A "loaded" version of the 2200 SVP with 64K bytes of user memory, a Wang 2236 terminal, a 120 char./sec Wang matrix printer and 4M bytes of hard disk plus 500K bytes of floppy disk storage sells for \$19,000, the company said.

Four Concurrent Users

Wang's mid-range offering — 2200 LVP — can support four users concurrently and is similar in architecture to the 2200 MVP. It includes 32K bytes of user memory, a Wang 2236 high-resolution terminal with 12-in. diagonal screen, a 120 char./sec Wang ma-

(Continued on Page 69)

Zilog Unveils Three Entry-Level Units

CUPERTINO, Calif. — Zilog, Inc. has introduced three stand-alone, entry-level microcomputers that combine multitasking software with advanced system hardware.

The MCZ-2 systems are based on the 4-MHz Z80A microprocessor and include 64K bytes of memory. They were designed for business/accounting, information processing, software development and other specialized applications.

The series will gain a local networking option, called Z-Net, for multistation and multiprocessing functions later this year, the company indicated.

Three microprocessors are presently available.

The MCZ-2/20 is a tabletop system offered in modular building-block increments. The basic system, which does not include software, disk storage or peripherals, is priced at \$5,990. With 2.4M bytes of floppy disk storage, the price is \$10,250. The MCZ-2/20 will be available in May.

The MCZ-2/25 is a 19-in., rack-mountable system identical to the MCZ-2/20 in features and pricing. Optional rack-mountable dual floppy disk drives are also offered. The MCZ-2/25 is scheduled to be available in June.

The MCZ-2/50 is a "ready-to-run" system package for business/accounting applications. It includes the MCZ-2/20 plus 2.4M bytes of floppy disk storage, a 1,920-char. CRT, Zilog's RIO/CP multitasking operating system and single- or multiterminal Cobol runtime support. The addition of Zilog's printer options offers single-vendor support for generic business applications. Price of

the MCZ-2/50 is \$12,175; the system will be available in May.

The RIO/CP (concurrent processing) system allows applications to be broken into modular tasks that are executed concurrently, Zilog said. Because the user can access a special program called the Kernel either through RIO/CP or directly, he can supply his own operating system for specialized applications.

Z-Net, when introduced later this year, will permit a number of single-user computer stations to be connected via passive high-speed, serial coaxial cable links.

Z-Net, the company added, will provide a means of distributing a system's low-cost el-

ements (CPU, memory and CRT) while sharing the high-cost elements (such as peripherals and a disk that provides a common data base for the system).

Each MCZ-2 station can support up to five asynchronous lines. Any device with an RS-232, 20mA current loop interface protocol (such as a CRT terminal, ASCII character device or point-of-sale terminal) can reportedly have its own interface program resident in the MCZ-2/20, 2/25 or 2/50.

In addition to Cobol, two other high-level languages — Basic and Zilog's own PLZ — are also available in single terminal mode.

Zilog is located at 10340 Bubb Road, Cupertino, Calif. 95014.

GA Pair Boasts Lower Prices, Sports High-Density Memory

ANAHEIM, Calif. — General Automation, Inc. has unwrapped two minicomputers that incorporate high-density memory technology and are priced at 20% or 40% less than systems in the firm's GA-460 line.

The GA-470 is a 240-nsec processor with 128K bytes of 22-bit error-correcting memory. It includes a memory protection subsystem, autoload bootstrap, interactive programmer's console, RS-232 and current-loop serial I/O interfaces and chassis with power supply.

The GA-470 is priced at \$14,995 which, the vendor said, represents a 20% reduction over the GA-460 processor.

The GA-480 is a 240-nsec processor with

256K bytes of 22-bit error-correcting memory, expandable to 2M bytes. The system includes a multimap memory management system, autoload bootstrap, interactive programmer's console, RS-232 and current-loop serial I/O interface and chassis with power supply.

The GA-480 is priced at \$17,995, 40% less than equivalent GA-460 processors, GA said.

Lower prices are not the only benefit the vendor claims for the systems. The Hypak memories with error-correction provide a fourfold increase in memory system mean-time-between-failures, GA said from 1055 South East St., Anaheim, Calif. 92803.

MULTIMULTIWORD

Plessey's Associate Processor Reconfigured for DEC PDP-11S

GAITHERSBURG, Md. — An associate processor for the Digital Equipment Corp. PDP-11 series of minicomputers is available from Plessey Microsystems.

A reconfigured Plessey Miproc-16 high-speed 16-bit computer, the Miproc-16 associate processor provides preprocessing, postprocessing or I/O handling capabilities for any DEC PDP-11 series machines.

The unit features a 250 nsec instruction execution time that enhances the processing ability of any PDP-11 where I/O

overheads need to be reduced, the company said.

I/O between the two computers takes place on a direct memory access (DMA) to DMA basis. A general-purpose PDP-11 DMA to Miproc-16 DMA software handler is included.

The program and the data to be processed can be downloaded to the Plessey unit from the DEC machine. The program is developed on a macro assembler and linker that runs under RT-11 or RSX-11 on the host computer. Control of the Miproc-16 is

handled from the PDP-11 console.

Plessey options include a debug monitor, analog-to-digital and digital-to-analog modules and a three-card set of 32-bit floating-point hardware.

The Miproc-16 costs \$13,750 with CPU, 16K bytes of random-access memory, program loader and Miproc-PDP-11 DMA (DR11-B) system.

Plessey is located at 19546 Clubhouse Road, Gaithersburg, Md. 20760.



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Disk Controllers Link DEC, DG Minis

PALO ALTO, Calif. — Minicomputer Technology, Inc. has unveiled three single-board emulating disk controllers for users of Digital Equipment Corp. and Data General Corp. minicomputers.

First in the lineup is the EDC24, an emulating disk controller for DEC LSI-11 mainframes.

The EDC24 interfaces any DEC LSI-11 computer having a Q-bus interface to one or two storage module drive (SMD) or SMD-compatible drives. This quad-size single-board controller emulates several DEC disk subsystems, including RK06/07 and RM02/03, and Minicomputer Technology's own SMC11 controller.

EDC24 Features

Features of the EDC24 include 32-bit error-correcting code (ECC) for data error detection and correction, correcting bursts up to 11 bits; cyclic redundancy check for header error detection; single-command multiple-sector transfers up to 64K-byte words; selectable direct memory access (DMA) throttle rate; and three-sector buffering.

The EDC24 lists for \$4,500.

The company's second offering is the EDC22, an emulating disk controller for DG's Nova and Eclipse or compatible CPUs. Controlling up to four SMD or SMD-compatible drives, the single-board EDC22 emulates DG's Zebra controller (6060 series disk subsystems).

Features of the EDC22 include 32-bit ECC for data error detection and correction, correcting bursts up to 11 bits; single-command multiple-sector transfers; selectable DMA throttle rate; and three-sector buffering.

The EDC22 lists for \$4,400.

The third offering is the EDC21, an emulating disk

controller for DEC PDP-11 mainframes having a Unibus interface. The hex-size single-board EDC21 controls up to four SMD or SMD-compatible drives and emulates several DEC subsystems, including RK06/07 and RM02/03. Features of the EDC21 are similar to those of the EDC24.

The EDC21 lists for \$4,500. Minicomputer Technology is located at 2470 Embarcadero Way, Palo Alto, Calif. 94303.

end local network in which multiple computers are connected in a star configuration with each computer interface using the standard Corvus bus. The center of the star is the Constellation host multiplexer that polls up to eight computers in round-robin fashion.

A two-level network containing up to eight host multiplexers connected to a central multiplexer allows up to 64 computers to share the disk. All computers in the network are active, the company said since the central node is a multiplexer and not a dedicated computer.

Total capacity of the disk system is up to 40M bytes (four 8-in. Winchester disk drives), and any personal computer compatible with the standard Corvus disk system is compatible with the Constellation. These include the Apple, from Apple Computer, Inc. and Radio Shack's TRS-80 models 1 and 2.

The price of the Constellation multiplexer is \$750. Interfaces for the network computers begin at \$235 each, the vendor said from 2029 O'Toole Ave., San Jose, Calif. 95131.

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Micro Helps Tenants Become Home Owners

ALTAMONTE SPRINGS, Fla. — A microcomputer is helping prospective buyers learn that buying a condominium can be cheaper than paying rent in this southeast Florida community.

Capistrano Condominiums uses a Radio Shack TRS-80 to help prospective buyers determine just what they can save if they buy one of the 236 units here. Each person is encouraged to sit at the unit and figure it out for himself.

The client can call up a program that prompts him to type in appropriate figures for annual income, current monthly rent and price of the condominium. Almost immediately, the system generates a print-out indicating mortgage costs — minus tax deductions — and compares those costs with the amount paid for rent.

Does the micro help to sell more condominiums? "We can never know whether it is a factor, because we can't measure its effect, but I feel it is a strong factor in our sales," George Vickery said.

Vickery is president of Equity Realty, an Atlanta-based concern that converts apart-

ments to condominiums and sells them.

Question of Trust

The system is effective largely because customers seem to trust its information more readily than statements from sales personnel, Vickery said.

The computer also attracts those people who are just beginning to explore the possibility of condominium ownership and may be reluctant to

discuss their financial positions with a salesperson. They can keep such information to themselves at Capistrano because they can work directly with the computer to determine whether they can afford to buy, Vickery said.

Using a highly conservative 7% inflation rate, the buyer can compare future rent to be paid with potential savings from tax refunds and the rising value of the condominium.

The micro makes it clear that there is an advantage to making mortgage payments instead of collecting rent receipts. Over 10 years, the savings are "really striking," Vickery said.

Although the computer's current programs cannot indicate a client's exact future savings if he opts for a condo instead of a rental unit, the estimate given is usually promising enough to provoke serious

consideration of a purchase, Vickery added.

Equity Realty also sells condominiums to investors who operate them as rental properties. For these buyers, the microcomputer figures how their investment will turn out over time. It deducts everything that can be deducted in an investment property and calculates depreciation according to how old the property was at time of purchase.

Wang Adds System Trio

(Continued from Page 67)

trix printer, 1M byte of double-density, double-sided floppy and 2M bytes of hard disk storage via the 8-in. Shugart sealed disk drive. Cost of this basic configuration is \$17,600.

Options on the 2200 LVP include 64K or 128K bytes of memory and either a 4M- or 8M-byte Shugart sealed disk drive.

The 2200 SVP and 2200 LVP incorporate the 500K- and 1M-byte floppies respectively because, the company said, "they provide fast backup and are compatible with the IBM 3174 type diskettes." In addition, the machines' operating systems are "soft loaded" from the diskettes, thereby removing most of the overload from the user memory.

Meanwhile, at the low end of the 2200 series, the PCS-III replaces the Wang PCS-II.

Though similar in appearance to the PCS-II, the PCS-III incorporates single-sided, double-density diskettes that bring storage capacity to 143K bytes per drive.

The PCS-III supports Wang's Basic and all other options available on the old PCS-II, including system disk multiplexing to larger Wang 2200 computers.

Depending upon the configuration, the PCS-III is priced from \$6,500 to \$10,500, from Wang at One Industrial Ave., Lowell, Mass. 01851.

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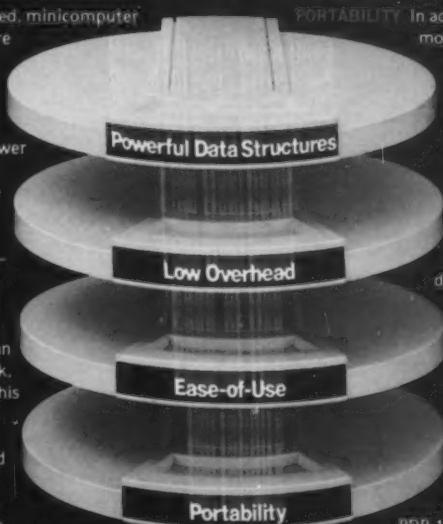
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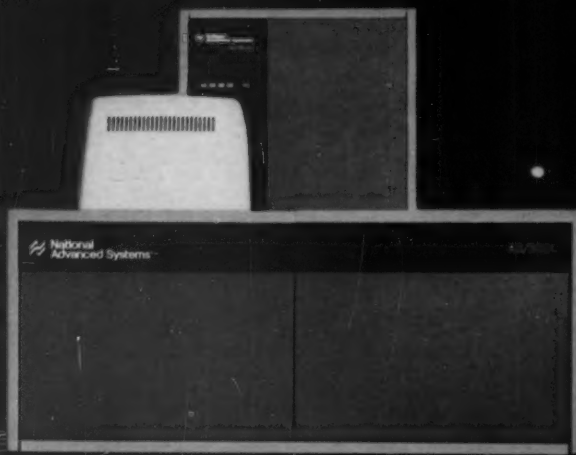


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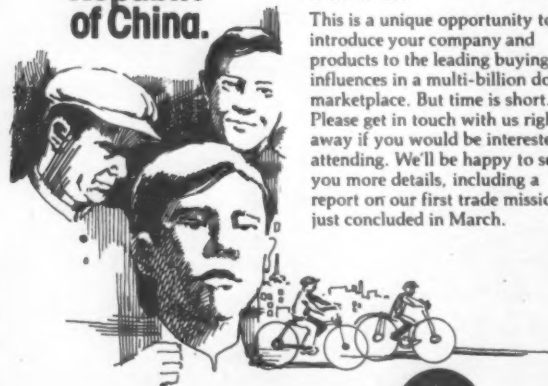
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We have already concluded a very successful mission to the People's Republic (PRC), and our second will be leaving on May 29th.

The Fourth Ministry Machine Building has asked us to organize a second trade mission to the PRC, and it has been scheduled for May 29th to June 14th.

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Radix Turnkey Mini System Aids Inventory Management



Radix Employee Checks Customer's Order on Auto/Mate

CAMBRIDGE, Mass. — A turnkey minicomputer system to help automotive warehouse distributors tune up their inventory management is available from Radix Systems Corp.

Radix Auto/Mate uses a Digital Equipment Corp. PDP-11/34A for on-line interactive data entry capabilities to improve inventory management, customer service and "will-call" orders.

System capabilities include core bank analysis, order processing, invoicing, accounts receivable, suggested purchase orders, on-line inquiries, lost sales and profitability reporting by customer and product line.

The system incorporates the DEC minicomputer and up to two 28M-byte RK07 disk drives, a 300- or 600-line/min band printer, up to 14 CRT terminals and a choice of 11 software modules, including Transnet purchase order capability.

The vendor claims the system can be operational within one day after hardware installation.

Based upon hardware and software options, the installed price of the system ranges from \$100,000 to \$120,000. Third-party leasing is available, the vendor said from 675 Massachusetts Ave., Cambridge, Mass. 02139

Perkin-Elmer Mini Users Get Graphics Capability

ANAHEIM, Calif. — Macrolink has introduced a line printer controller for Perkin-Elmer Corp. minicomputers that provides an interface with dot matrix printer/plotters for business graphics applications.

Able to accommodate printer speeds up to 500K byte/sec, the controller is software-compatible with both the OS/16 and OS/32 operating systems and host-supplied diagnostics, Macrolink claimed.

The half-board module plugs directly into the I/O slot of Perkins-Elmer's 16- or 32-bit processors contains three industry-standard printer interfaces: Centronics Data Computer Corp., Dataproducts Corp. and Data Printer Corp.

The controller is supplied with pin-

compatible Perkins-Elmer cables and replaces the host machine's printer interface. Switches rather than wire jumpers are used in the device's design to allow hardware functions to be changed on-site; these functions include device address, printer type and special printing routines, a spokesman state.

The controller reportedly uses half the power of the host-supplied interface and employs Shottky integrated circuits said to reduce heat build-up and power supply drain.

Burned-in and tested, the controller costs \$650. OEM discounts are available.

Macrolink is located at 1740-E S. Anaheim Blvd., Anaheim, Calif. 92805.

Unit Boosts Multibus Storage

READING, Mass. — Datacube, Inc. has introduced a read and write memory board that can incrementally expand Multibus system storage by up to 64K bytes.

The Model RM-119 is a Multibus-compatible, high-density board that boosts capacity of Intel Corp. single-board computers to 64K bytes in 16K-byte increments, the company said. The Datacube board provides on-board refresh, can be used with 16- or 20-bit address buses and can be selectively disabled in 16 blocks of 4K bytes

each.

Model RM-119 uses large-scale integration memory and operates on +5V at 1A, -5V at 0.01A and +12V at .5A. The board is fully socketed to accept up to 64K bytes of industry-standard 4116 memory.

The RM-119 is offered in 16K-, 32K-, 48K-, 64K-bytes and unpopulated versions and is priced at \$620, \$1,020, \$1,390, \$1,650 and \$495, respectively.

Datacube is located at 670 Main St., Reading, Mass. 01867.

Gearing Up for Unified Response

U.S. Facing Japanese Semi Challenge

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — After 18 months of study, the U.S. government is now developing a unified response to the Japanese penetration of the American semiconductor market, which approaches 50% in some segments.

An interagency meeting here today will consider a State Department "framework paper" that seeks to define that problem by comparing the U.S. and Japanese semiconductor industries in terms of access to capital, government support, research and development and foreign competition.

"Explosive growth, rapid technological development, short product cycles, increasing capital requirements, highly competitive global markets and growing foreign government intervention create serious challenges for the U.S. semiconductor industry," the paper noted.

Basic Definition

Once the government agrees on a basic definition of the problem, it will be able to work with industry in meeting those challenges, according to W. Andrew Osterman,

a State Department economist specializing in East Asian affairs.

Osterman, who put together the framework paper with Harvard Law School professor Dr. Julian Gresser, said the interagency meeting is an attempt to "get ahead of the problem."

"Before the government can do anything, it has to understand what exactly it is mucking about in," he said. The most likely form of government action would involve amending U.S. tax laws and so would have to come from Congress, according to Osterman.

"The whole purpose of this project is not to tell the industry what needs to be done but to organize the American government, so that when the industry does come and wants to seriously talk about its problems, it isn't shunted from one agency to another, from one collection of people without substantive background to another," he explained.

The problem has been under study by Congress, the Commerce Department and the International Trade Commission as well as the State Department. State is taking this initiative because if a full-blown U.S.-Japan trade dispute arises over semiconductors,

the department will be the first to have to deal with it, Osterman said. "It would blow up in our face first."

Framework Paper

The framework paper has been circulated for government agency comment. The document, a copy of which was obtained by *Computerworld*, discusses U.S.-Japan semiconductor issues in four areas.

- Access to capital. U.S. industry

(Continued on Page 75)

Boole & Babbage Lays Off 27, Replaces Chief

SUNNYVALE, Calif. — Anticipating a slowdown in sales, Boole & Babbage, Inc. has laid off 27 people, reducing the parent company's total employment to about 120 people.

Recent sales figures have shown that "the next few months will be sticky," Franklin P. Johnson, the firm's chairman, noted. The firm is privately held and sales figures are not available, but are estimated in the \$5 million to \$10 million range.

In a seemingly related move, the firm announced the resignation of its president Michael Patatucci. The recent resignation arose over a policy disagreement between Patatucci and the board of directors, Johnson noted, declining to be more specific.

Taking over as chief executive on May 5 is Jack E. vans Kinsbergen, who was formerly vice-president of Citicorp Management Services.

The layoffs were made primarily in sales and administration personnel, Johnson said, adding that none of the engineering or customer support personnel were let go.

Prior to the streamlining, Boole & Babbage had separate marketing groups for each of its three operating system products. The groups have been consolidated into a single marketing organization.

The firm's European software company has not been impacted by the layoffs.

Univac Targets System 80 At IBM System/3 User Base

NEW YORK — "If the revenue from this product does not exceed \$1 billion, I will be very disappointed."

With that remark, Univac President Richard L. Gehring launched the System '80 [CW, April 21]. A small to medium-range general purpose system, the System 80 is aimed squarely at the IBM System/3 base.

"A major portion of the new business for the System 80 will be drawn from the customer base of the competition, specifically IBM, rather than from new customers," H. Glen Haney, vice-president of worldwide marketing, asserted. Univac expects 19% of System 80 sales to come from IBM's System/3 base of some 15,000 users, he added.

Haney claimed the System 80 offers these users a better migration path than IBM's current follow-on systems. He noted that "several hundred System/3 users have already been converted to the Univac OS/3

operating system."

To a lesser degree, Univac's system will also target prospects for IBM's 4331 and System/38.

New Accounts

Commenting further on the potential customer base for the system, Haney disclosed that some 65% of Univac's Series 90 business is comprised of new accounts. The firm expects an even larger percentage of new account business from the System 80.

From its own user base, the system will serve as an upgrade for its 9200, 9300, 9400, 9480 and BC/7 systems.

Although directed to small and medium-scale systems users, the System 80 is also geared for use by larger DP installations for distributed processing. "It's a key element in the company's distributed processing strategy," Haney noted.

(Continued on Page 80)



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From Last Year's First Quarter

NCR, Honeywell Earnings Slip 15%, 21.5%

As anticipated, both NCR Corp. and Honeywell, Inc. reported declines in earnings from last year's first quarter. NCR's first-quarter earnings dropped 15% and Honeywell's slipped 21.5%.

However, both mainframers reported boosts in revenue for the first quarter. NCR's revenue rose 11% and Honeywell's 17% from last year's first quarter.

William S. Anderson, NCR chairman, attributed the disappointing results to production shortfalls caused by problems in manufacturing certain semiconductor chips in-house. Shipments of several products were delayed.

For the quarter, earnings totaled \$25.9 million or 96 cents per share on

revenues of \$657.5 million. Last year, the firm's first quarter revenues were \$590.4 million and earnings were just over \$30 million or \$1.13 per share.

Earnings were also adversely affected by increased expenditures for research and development and by a "significant decline in interest income," Anderson noted. The reduced interest income resulted from the cash acquisition of Comten, Inc. last June.

Honeywell Results

From Minneapolis, Honeywell reported earnings of \$46.8 million or \$2.11 per share, down from earnings of \$59.6 million or \$2.75 per share in the first quarter a year ago. Revenues advanced to \$1.1 billion, up from

\$966.8 in the like quarter of 1979.

Profit margins in both the computer and controls segments of the company were diminished by costs that continued to grow faster than the company's ability to raise prices and still stay within President Carter's guidelines, Edson W. Spencer, chairman and chief executive officer, noted.

Orders for computers were up significantly from the first quarter last year and backlogs remained at record levels, he said.

Revenue from computer rentals and service for the first quarter was \$188.8 million, up 14% from last year. Revenue from outright computer sales was about the same as last year, the company said.

Growth Rate For Industry Ranks Third

NEW YORK — Taking a retrospective look at the 25 years of Fortune 500 rankings, *Fortune* magazine noted that office products, including computers, ranked third of the five fastest growing industries.

For the past 25 years, computer firms sustained an average compound annual revenue growth rate of 11.1%, with earnings advancing 9.7%.

These figures include only companies that appeared on the list in both 1955 and 1980.

Splashy Gains

Computer firms have had some of the splashiest revenue gains since the listings were started.

Of the 30 companies now among the Fortune 500 that didn't exist in 1955, eight firms, or 27% of the total, were computer firms. Storage Technology Corp. made the list last year, ranking 457th with sales of \$479.4 million.

And IBM, which started out as number 61 on the list in 1955, with \$461 million in revenues, was number eight last year, down one peg from 1978.

Sustained Growth

Despite its current troubled financial times, IBM has sustained growth in both sales and earnings which rank it among the top 10 companies for the past 25 years.

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Based on Fortune's statistics for 1979, of the 28 industry categories listed, the computer industry ranked eighth in sales growth, with the industry median at 17.6%. Intel Corp. was one of the top 10 performers in the revenue category, growing 65.5% from 1978's sales.

As for growth in profit over the past year, the industry ranked sixth, growing at an industry median of 24.6%.

Vickers Resigns From Nixdorf Post

BURLINGTON, Mass. — Nixdorf Computer Corp. recently announced the resignation of W. Harry Vickers, vice-president of advanced technology.

Vickers was a founder of Entrex, Inc., a key-to-disk systems manufacturer which was purchased by Nixdorf in May 1977.

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Although Threatened by Japanese Competition U.S. Semi Industry Seen Lacking United Front

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Although the U.S. semiconductor industry is alarmed by rapidly increasing Japanese competition, it has not cooperated with U.S. agencies to do something about the problem, government officials complain.

While there have been some 15 hearings on the subject over the last 18 months, serious proposals from industry have been few and no united industry front has developed, according to government sources here.

When the industry was approached about joint R&D programs with the government, "they told us to go away," Dr. Jordan Baruch, assistant Commerce Department secretary for Science and Technology, said recently.

Addressing a group of DP industry executives earlier this month, Baruch said the semiconductor industry is "really not terribly concerned about the Japanese concentrated effort. U.S. companies see they have a lead, they see that they can hold that lead. They consider the developments in the United States as rapid as they can digest."

Similarly, State Department economist W. Andrew Osterman criticized

the industry for a lack of initiative. "The industry has been laggard," he said, "in coming up with serious proposals" for industry-government action.

"The principals in the industry, AT&T in the telecommunications side, IBM and 'the seven dwarfs,' TI [Texas Instruments, Inc.] and the little people — the big hitters in those three industries — have yet to come to the government with a serious discussion of where their industry is going, what they need to keep it going."

"The principal discussion with AT&T has to do with their problem with the Justice Department," Osterman continued. "TI hates the government in general — just will not talk to the government."

As expressed by Baruch, "there's no way to interact with an industry who's sure it knows the answers, and so we will wait." Baruch's sentiments were echoed by Osterman, who said industry executives have been unwilling or unable to look beyond their own particular corporate interests and discuss problems with the government on an industrywide basis.

"Nobody," Osterman said, "has ever come to Uncle Sam and said: 'Look, we're facing a capital crunch. We're

facing a silicon shortage. Your depreciation schedules are completely out of wack with the rest of the world's.' Nobody has ever said that from the industry."

Industry Issues

Osterman, who is working on a government "framework paper" on U.S.-Japan semiconductor industry issues (see story on page 73) said "if the industry cannot get its act together enough to tell the American government where it hurts, what its problems

are and propose solutions, then the government will do it itself" and present them for industry comment.

Warming to the subject, Osterman complained that industry lobbying here is short-sighted and ineffective. In Washington, he said, "most people are either silly or foolish or both. The Washington reps of the firms have no credibility."

On the other side of the coin, Osterman said, "the government has even less idea" of what to do about Japanese semiconductor competition.

Semi Exports From U.S. Totalled \$1 Billion in '79

WASHINGTON, D.C. — Semiconductors accounted for \$2.6 billion or 66% of the \$3.9 billion worth of electronic components exported from the U.S. last year, according to the latest statistics compiled by the U.S. department of Commerce.

Imports of semiconductors totaled \$2.4 billion, or 68% of the total \$3.6 billion worth of components imported last year.

Trade in total electronic components increased by 33% during 1979, resulting in a year-end trade surplus of \$384 million, 20% higher than in 1978. Semiconductor prod-

ucts accounted for \$179 million or 47% of the trade surplus, Commerce said.

Nearly two-thirds of semiconductor exports were parts of these components being sent to overseas assembly facilities, and 85% of the imports consisted of these devices being returned to the U.S., the Commerce Department noted.

Japan was the chief supplier of components to the U.S., providing 20% of total imports. Malaysia followed with 17% and Singapore was third with 13%.

U.S. Gearing Up to Face Japanese Semi Challenge

(Continued from Page 73)

need \$28 billion in investment in new plants and equipment during this decade, the paper said. And "U.S. firms are disadvantaged in comparison to their Japanese competitors in raising equity capital, debt and retained earnings."

U.S. debt-equity ratios are 15%-20% while Japanese ratios are 150%-500%, according to the document. And Japanese after-tax returns on equity and returns on sales are less than half that of U.S. firms, in contrast to "short term equity capital focus of U.S. firms."

In addition, Japanese tax policy encourages investment through rapid depreciation of equipment, whereas U.S. firms depreciate over seven years equipment that may have an economic life of only three years.

• **Government industrial promotion policies.** Unlike past Defense procurement programs that aided U.S. DP industry development, current military technology "lags behind commercial technology and provides minimal support for commercial development."

Whereas the Japanese government-supported R&D in semiconductors has stressed commercial development, the current U.S. government very high-scale integrated circuit program "is opposed by segments of the U.S. semiconductor industry because it will bid up prices for scarce engineering talent and provide little of commercial value."

• **Global market access.** The U.S. share of the Japanese semiconductor market declined from 6% in 1976 to 4.6% in 1978, while the Japanese increased their share of the U.S. market to 6% in 1979 and in some product

areas, such as high density memories, have captured as much as 42% of the U.S. market.

U.S. firms on the whole have been frustrated in their attempts to crack the Japanese market or invest in manufacturing there, the paper noted. Despite relaxed Japanese investment policies, U.S. firms still face "massive start-up costs [in Japan] and little opportunity to acquire an ongoing concern."

• **Foreign competition in the U.S. market.** Despite complaints from U.S. industry, it is "highly unlikely" the International Trade Commission could prove unfair pricing practices on the part of Japanese semiconductor companies.

In any case, "the injury from aggressive Japanese pricing practices is in the impact on the ability of U.S. firms to generate the sufficient retained earnings to make the increasing investments necessary to remain competitive in the future."

In terms of marketing strategy, foreign firms have "relatively open access to American technology," the paper said and noted that "in the electronics industry Japanese firms have waited until the technology is developed and a market is established before entering."

"Where U.S. semiconductor firms have made the investment to develop new technology and bring a new product to the market, Japanese firms focus on the high-volume segment of the market and aggressively force prices down the learning curve."

"Innovating U.S. firms are priced out of the high-volume market and must develop the next generation of products without the benefit of the sales of the preceding generation."

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Justice Antitrust Suit Against Bell Foundering

By Phil Hirsch

CW Washington Bureau
WASHINGTON, D.C. — The Justice Department's antitrust case against AT&T is showing increasing signs of running aground.

In 1978, when Philip L. Ver-veer resigned as the government's lead attorney, the whole trial staff was replaced. According to a knowledgeable source, "it looks now as if the same thing is going to happen again."

One of the staff's two deputy attorneys, Alex Pires, recently transferred to the Department of Housing and Urban Development, and "several" other staffers "are seeking a change of employment," he added.

The underlying problem, our source indicated, is that the Justice Department's case is suffering from lack of detailed direction. The current chief attorney, Gerald Connell, has been on the job only since last February, and he has just returned to work after spending

two weeks in the hospital.

There are also indications that Ma Bell's long-established monopoly may be succumbing to old age, a development that could pro-

Analysis

foundly affect the Justice Department's case.

According to a recent Frost & Sullivan study, AT&T will supply 55% of the PBX equipment sold in the U.S. this year, and independent "interconnect" manufacturers will provide the rest. In 1978, according to the same study, AT&T's share was 70%.

The gains and losses may be even greater than these percentages suggest because of the overall growth of the PBX market. According to Frost & Sullivan, domestic U.S. PBX sales will grow from \$70 million in 1976 to \$550 million in 1980.

Similar slippage may be oc-

curing in the private line transmission market. Figures are hard to come by, but it is probably significant that Bell's chief rival in this area, MCI Communications Corp., earned \$96 million last year compared with \$36 million the year before.

Meanwhile, Federal Communications Commission (FCC) policies and onrushing technology have encouraged several companies to become communication common carriers and compete with the Bell System. Since the pace of technological development is not likely to slow down, and the FCC's pro-competitive philosophy is not likely to change direction, there will probably be more new entrants.

Basic Premise

A basic premise underlying the Justice Department's suit is that AT&T's present corporate structure and share of market discourage competitors from entering the telecommunications business, and enable Bell — through price manipulation — to destroy existing rivals.

The evidence to the contrary, although fragmentary, seems to be increasing: Bell attorneys almost certainly will bring this to the attention of Judge Harold H. Greene, who is presiding over the antitrust trial.

Judge Greene has tried hard to shorten the trial by pressing both sides to "stipulate" — i.e., agree to — the disputed issues before they begin arguing them orally next September.

But he has not been particularly successful.

'Relevant Market'

The latest evidence is a Justice Department comment submitted to the court earlier this month. It was the sixth in a series of documents both sides have drafted regarding the "relevant market" to be considered in determining whether AT&T has violated the Sherman Antitrust Act.

Referring to an earlier definition proposed by AT&T, Justice said the telephone company had "posited an unrealistically broad market which will not admit of precise definition or quantification. Defendants' partial attempts at market definition are fraught with inconsistency, and their approaches to market share measurement are incomplete and arbitrary."

Although there was some lawyerly rhetoric in this statement, it was backed by some 30 pages of detailed, specific objections to AT&T's earlier formulation of the relevant market.

Perhaps the most interesting aspect of this debate is that both sides agree the market share question is really secondary.

AT&T concedes it is the dominant supplier of many telecommunication services, but quickly adds that this is the result of regulatory and legislative policy, not anti-competitive behavior by the telephone company.

The Justice Department insists the Bell monopoly results

from illegal use of its power in certain markets. As the recent statement to Judge Greene put it:

"The defendants' market shares do not fully portray the market power arising from the defendants' ability to foreclose competition as a result of their domination of local exchange telephone service."

"Since access to local exchange plant is required to provide telecommunications to end users, this domination gives the defendants power to control entry into the telecommunications services markets, power which can be preserved quite independently of their shares of those markets."

Thus, even if the argument over the "relevant market" were resolved, there would still be plenty to argue about. The lack of agreement on the size and content of that market simply adds to the list of unstipulated issues, thus prolonging the upcoming oral argument and probably strengthening AT&T's defense in the process.

For the longer the trial lasts, the more competitive the industry could become without help from Judge Greene and the Sherman Act.

The government filed suit against AT&T approximately six years ago on Nov. 14, 1974. How long the trial will last is anybody's guess, but it is interesting that the current market definition debate is similar to one that occupied opposing lawyers in the IBM antitrust case for some time. That case is now 12 years old.

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Fujitsu Acquires DPF's WP Unit

HARTSDALE, N.Y. — Primed to jump into the hot office automation market, Fujitsu America, Inc. (FAI) recently acquired the word processing (WP) group of DPF, Inc. FAI is a wholly owned subsidiary of the billion-dollar Japanese computer maker, Fujitsu Ltd.

Terms of the acquisition were not disclosed.

The 10 DPF employees working on the Word Machine product line will be retained by FAI, according to John J. Puttre, now director of the Word Machine Group of the Japanese firm.

Puttre, formerly with DPF, said FAI will lease space in both Westchester County, N.Y. and Florida for the administration and production

of the word processing line.

From this base, FAI plans on marketing the Word Machine in both the U.S. and Europe.

The system reportedly runs with all IBM and IBM-compatible processors. While the system was not formally marketed by DPF, a computer leasing firm, it is in Beta test sites with some Fortune 25 companies, Puttre said.

Contracts

Vermont Research Corp., a computer memory manufacturer, has signed an OEM contract with Amdahl Corp. to supply quantities of its Model 4008 head-per-track memory systems for Amdahl's 470 series.

Ramtek Corp. has signed a contract with Grumman Data Systems to provide 14 RM 9400 high-resolution color raster-scan graphics systems for use in jet engine testing for the U.S. Air Force.

The Search Division of Research, Inc. has been awarded

a \$1.25 million, two-year contract by the State of California for the purchase of more than 1,000 Teleray CRT terminals to be installed throughout the state college and university system.

Century Data Systems, Inc. has announced a contract to deliver 50 of its Trident disk drives to Dynamic Electronics, Inc. for its small business systems.

The New Orleans Commodity Exchange, a new commodities exchange scheduled to open this summer, announced

that Market Data Systems, Inc., a Memphis-based supplier of commodity futures price quotation systems, will design and install a computer-based price quotation system for the Exchange.

Vector Graphic, Inc. has signed a \$4 million contract with International Power Co. of Madras, India.

Boeing Computer Services (BCS) and First National Bank and Trust Co. of Salina, Kan., have signed a multiyear agreement for BCS to provide DP services to First National.

Judge Upholds Finding Against Arthur Young

MILWAUKEE — A circuit court judge here has upheld the jury decision that found Arthur Young & Co. guilty of stealing trade secrets from M. Bryce Associates, Inc., a Cincinnati-based information processing consulting firm.

When the original decision was handed down earlier this year, the Association of Data Processing Service Organizations, Inc. hailed the verdict as an affirmation of its position that service firms' proprietary secrets are vulnerable to mis-

appropriation by big accounting firms [CW, Feb. 11].

However, Arthur Young will appeal that decision, according to the Big Eight accounting firm's attorney Carl Ligio. He said he is now preparing a brief for the appeal and will file it with Wisconsin's appellate court as soon as the circuit court enters its judgment.

A.B. Dick Buys Cortex Interest

CHICAGO — A.B. Dick Co. has purchased a 30% interest in software producer Cortex Corp. of Wellesley, Mass., with an option to increase its participation in four to five years.

This is the company's first venture into software products, and the move was made to compliment another recent A.B. Dick purchase — the shared-logic word processing product manufactured by Hendrix Electronics, Inc., Manchester, N.H.

Nearly three years old, Cortex Corp. markets a software package called "Inform," a database management system originally developed by United Computing Systems and designed for a variety of information applications.

Participation in Cortex will add another dimension to A.B. Dick's system approach to the automated office, the firm noted.

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Centronics Names New Chief

HUDSON, N.H. — Announcing he was leaving the day-to-day operation of Centronics Data Computer Corp., Robert Howard recently appointed Michael D. Kaufman president and chief operating officer of the company.

Howard, who founded the printer firm 12 years ago, will remain chairman and chief executive officer.

Kaufman comes to Centronics from a 13-year career

with Xerox Corp. His most recent positions with Xerox were director of corporate financial planning, director of corporate product and strategy analysis and chief staff officer of the retail market division.

Also named to the new corporate post of executive vice-president is David Levi, who joined the firm last September as senior vice-president.

In the past two years, Cen-

tronics has added 15 corporate executives to its management team. Howard noted that until recently the company's management was too thin.

Centronics' earnings for the past two quarters have lagged behind last year's results. In addition, the firm was forced to shut down its miniprinter assembly line for six weeks this quarter because of problems with semiconductor components.

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*Skip Little,
Supervisor of Systems Analysis and
Systems Programming,
VAX Computer Group,
Woods Hole Oceanographic Institution,
Woods Hole, Massachusetts*

Scientists at the Woods Hole Oceanographic Institution gather massive amounts of data about the earth's oceans. But until recently the only way they could analyze much of that data was by sending magtapes to and from a giant Cray 1 computer located 1800 miles away.

So the Institution decided to buy its own VAX from Digital.

Here's what Skip Little, Supervisor of Woods Hole's VAX Computer Group, has to say about VAX program capacity: "Some of the smaller versions of Cray modelling programs can actually be run on VAX. That's remarkable because the Cray 1 computer is the world's most powerful commercially-available system."

Now the problems they had in doing large data analysis and timesharing simultaneously are a thing of the past. Says Little, "We're able to lock our biggest jobs—like synthetic seismogram generation and fluid dynamical modelling—into VAX's main memory, while other timesharing users can be handled by the virtual memory system."

And Little has found that program conversion is a breeze: "We've converted programs from practically every kind of computer you can imagine with great ease."

**"With VAX's virtual memory,
there isn't a PC board around
that's too large for LASAR
to handle."**

*Fred Grant,
LASAR Product Manager,
Teradyne, Inc.,
Boston, Massachusetts*





Teradyne, Inc. makes a wide range of automatic test equipment including computer-based systems for testing printed circuit boards. To help their customers program the most complex of these PC board test systems, Teradyne developed a sophisticated software package called LASAR.[™]

But until Teradyne looked at Digital's VAX-11/780, LASAR was only available to customers through a timesharing service on a large batch-oriented mainframe. The software package was just too big for anything less.

Now with LASAR running on VAX, Teradyne will have the program capacity they need, in a system their customers can afford to purchase.

"When you reach the limit of main memory, VAX automatically puts the program into virtual memory," Grant says. "That's a key factor in our LASAR development work. Test programmers can develop more complete programs without being limited by memory size."

Has Teradyne sacrificed performance by switching from the mainframe?

"Definitely not," says Grant. "In our benchmarks, VAX matched up one-to-one with the mainframe. That really impressed us."

And VAX's interactive capability should be a big plus for Teradyne's customers: "Several people can program on VAX simultaneously, and they can monitor the progress of their programs as they work."

"There's more programmer involvement with VAX, and more efficiency too."

"Without Digital's VAX, our specialized design work just wouldn't be as cost effective."

*Stephen Tritter, Senior Principal Engineer,
Engineering Computer Facilities,
E-Systems, Inc., ECI-Division
St. Petersburg, Florida*

The ECI Division of E-Systems, Inc., designs high-technology electronics and communications equipment for the U.S. Government. And that requires huge computer programming space.

So virtual memory capability was an important factor in the E-System decision to buy a VAX.

"We're doing a lot of work now that we couldn't have done without Digital's VAX," says Steve Titter, Senior Principal Engineer.

"For example, we use the VAX to help us design our own LSI integrated circuit chips. That means keeping track of thousands of points, each with several different characteristics. It's a big job."

"And while that analysis is running, other people are performing high-frequency radio propagation studies using as many as 210,000 memory locations, or running Fast Fourier Transforms with up to 8,000 points."

Tritter says that ECI regularly has 10 to 12 engineers working interactively on VAX at a given time.

"We're very happy with VAX system performance," he adds. "We expect to add more memory, and eventually service 50 to 60 simultaneous users."

Digital's VAX-11/780, with its 4 billion bytes of virtual memory, has set a new standard for program capacity. This means you can run large programs easily on VAX, with a potential for growth that's unmatched in the industry.

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Displaced Teachers Tapped Programmer Shortage Spurs Retraining Project

By Marcia Blumenthal
CW Staff

BOSTON — As the saying goes, "Necessity is the mother of invention." A critical shortage of programmers at Massachusetts computer firms is spurring the industry to devise increasingly creative ways of training and recruit-

ing this rare commodity.

One pool of potential applications programmers is teachers who have been laid off as the result of declining enrollments in the state's public school systems.

Recognizing this untapped resource, the Massachusetts High Technology Council, a

consortium of high technology firms, the Massachusetts Teachers Association (MTA) and the state Office of Education recently received \$79,000 to launch a pilot project to retrain unemployed teachers as programmers.

Starting possibly as early as July, 34 displaced teachers will attend a six month, five day/week training program at the Keefe Vocational Technical School in Framingham, Mass.

Industry Consultation

Although industry is not directly funding the program, firms such as Digital Equipment Corp., Data General Corp. and Wang Laboratories, Inc. have provided consultation on the curriculum for such a program.

And while there is no specific promise of jobs to trainees upon completion of the program, the companies are reportedly interested in hiring the grads, according to Dr. Felix Zollo, MTA's director of research.

The MTA estimates entry-level salaries for teachers completing the training will be comparable to current teachers' salaries, which presently average about \$17,000.

Some 400 teachers are expected to be laid off this month. To qualify for selection for retraining, teachers must take a standard DP aptitude test and will have a personal interview with a DP professional.

Need for Professionals

One of the aims of the experimental retraining program is to see whether persons with little or no math or science background can be assimilated into a high-technology firm, according to B.J. Rudman, a consultant to the High Technology Council.

Vendors have a critical need for professionals who aren't engineers, he continued. Technical writers are another example of this category of employee, and state depart-

ment of education is currently developing a teacher retraining program for technical writers.

Keefe Vocational has subcontracted the training out to Data, Inc., a Burlington-based consulting firm, according to Fred Cronin, coordinator of DP programs at Keefe.

The students will learn Cobol primarily, but will also receive a smattering of RPGII, assembler, Fortran and Basic as well as learn about operating systems and the concept of data base design.

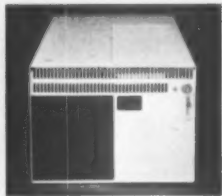
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CDC Plans Business Center To Draw Jobs to Inner City

PHILADELPHIA — Control Data Corp. is establishing an \$8 million Business and Technology Center in this city's West Parkside neighborhood as part of a nationwide effort to attract small business and new jobs to inner cities.

Based on large-scale job creation coupled with comprehensive work-force training, the revitalization project has a target of 2,500 new jobs for residents here.

The center is the first part of a five-year project undertaken by the city and City Venture Corp., a consortium of 15 businesses and churches, of which CDC is the largest stockholder.

Under the new agreement, CDC will build or remodel and manage the Business and Technology Center, and the city will acquire the property and provide CDC with access

to city industrial development incentive programs.

Businesses will rent space and have access to central support facilities such as laboratory and conference space, secretarial and copying services, CDC data services, technology transfer and management assistance services and an employee training area featuring the Plato education system.

The total program involves job creation, education and training, day care, part-time employment and other strategies to increase work opportunities.

It also provides for rehabilitation and housing construction and the use of new technologies for neighborhood security, energy production and conservation, public transportation, urban agriculture and health care.

Univac Targets IBM Base

(Continued from Page 73)

As for vertical markets, the System 80 is targeted at manufacturing, distribution, education, local government, medical and transportation. While special application packages are being developed, the company will not announce them prior to the delivery of the first System 80s, which is scheduled for year's end.

However, Univac did announce Unidis, a System 80 application package for the manufacturing and distribution industry. Moreover, Un-

ivac said it is enhancing its Unis manufacturing control system for the System 80.

To reach these target markets, Haney said the company is departing from its usual marketing methods. Starting last week, the firm instituted a series of monthly seminars in 40 major cities in the U.S. and Canada.

Moreover, equipment centers will be established in more than 60 locations throughout the world for demonstration, instruction and conversion purposes.

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Informatics Sells Series IV to Sasy

LOS ANGELES — Informatics, Inc. has sold the title and marketing rights to Series IV — a minicomputer applications development software product — to Sasy S.A., located in Nyon, Switzerland.

Sasy participated in the original development of the product and had handled the overseas marketing effort for Informatics since 1977.

Commenting on the sale, Informatics President Walter

Bauer said, "The effect of the sale of Series IV on Informatics' 1980 software product [financial] performance will be more than offset because our resources will be more effectively allocated to marketing our new implementation products."

Series IV, which is designed for Digital Equipment Corp.'s PDP-11, permits computerized entry and validation of data at terminals in both real-time and batch-entry modes.



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Shortage of Skilled Personnel Seen Top Challenge to Electronics Firms

By Jeffrey Beeler

CW West Coast Bureau
SANTA CLARA — The acquisition and retention of skilled personnel is the most serious challenge facing U.S. electronics firms during this decade according to Applied Materials, Inc. president Jim Morgan. Morgan's assessment came during a recent meeting here sponsored by the Semiconductor Equipment and Materials Institute.

Other speakers participating in the panel discussion included Monolithic Memories, Inc. President Irwin Federman and Durango Systems, Inc. President George Comstock. Together, the three speakers provided some tips on how executives in the personnel-starved electronics field can keep the qualified employees they already have and attract new ones.

'Stick to Basics'

Morgan, for his part, advised computer equipment and semi-conductor firms to "stick to the basics" in their efforts to lure skilled personnel into their corporate folds. One of the surest ways to secure the services of desirable employees is simply to run a high-quality company, Morgan explained.

If a firm has a reputation for being well-managed and successful and if it offers job sat-

isfaction and an opportunity for achievement, he added, good people will want to work there.

Another key to maintaining an adequate work force is to delegate decision making to the lowest possible level of the corporate hierarchy, Morgan said.

In a small, start-up operation, a few top executives can probably monopolize key management decisions with little or no ill effects on employee morale. But after a company grows beyond a certain point, its managers should relinquish some of their decision-making authority to as many of the employees working under them as possible, Morgan advised.

'Winning Attitude'

Federman, by contrast, saw success in the personnel race as primarily the product of a "well-founded company philosophy."

One of the key requirements for such a philosophy is the presence of a companywide "winning attitude," Federman said.

If executives can encourage their subordinates to think positively and convince them they truly control their own destinies, the chances are they will succeed as individual employees, and the firm they work for will prosper as an organization.

A second prerequisite for a well-founded company philosophy is the ability of managers to communicate a sense of trust in their personnel, Federman said.

Employees who are assigned a task and are then trusted to carry it out without assistance are much more likely to succeed in their efforts than individuals who are continually supervised.

Excessive supervision is viewed by most subordinates as a sign of distrust by upper management. Executives, therefore, should restrain the impulse to constantly look over their employees' shoulders to check the quality of their work, the Monolithic Memories president said.

Company Pride

A third basic ingredient of a successful corporate philosophy is management's ability to instill a sense of company pride in its employees, Federman said.

The key to creating such pride is to show subordinates genuine respect and convince them that their contributions to their firms' well-being truly matter.

At his own company, some of Federman's techniques for making his employees "feel good about themselves" include profit-sharing plans, service awards and periodic parties for all personnel.

Executive Corner

• Edward A. Money and Charles W. Missler will join the board of directors of Datum, Inc., subject to elections at the annual shareholders meeting in May.

• Gary E. Sharpe has been appointed general manager of computer products at Racal-Milgo, Inc.

• Stephen P. Marcy has been named Peripherals Division vice-president, engineering for Pertec Computer Corp.

• Edward M. Cherney, president of CMI Corp., has been elected president of the Computer Lessors Association, an international trade association for the third-party leasing industry.

• Edward J. Roach has been named vice-president of marketing for the Honeywell, Inc. Aerospace and Defense Group.

• Albert C. Schiff has been appointed vice-president of EDP Audit Controls, Inc.

• William Newall has been appointed vice-president of Monchik-Weber Advance Technologies, Inc., a subsidiary of Monik-Weber Corp.

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- ☐ Sr. Engineer
- ☐ Principal Engineer
- ☐ Project Engineer
- ☐ Engineering Supervisor
- ☐ Engineering Manager

SYSTEMS ENGINEERING Systems Analysis

Concept Development

- ☐ C³ Operational Concept Development
- ☐ Command and Control Analyses
- ☐ Trade Studies and Analyses
- ☐ Definition of Communication Interfaces

Simulation and Modeling

- ☐ Network Traffic Modeling
- ☐ Math Modeling and Simulation to Validate Systems Performance
- ☐ Trade Studies and Analyses
- ☐ C³ Simulation Requirements

Systems Architecture

- ☐ Nodal Integration
- ☐ Multi-Subsystem Activities and Trade Studies Coordination
- ☐ Development of Nodal Equipment Block Diagrams
- ☐ Trade Studies and Analyses
- ☐ Interface Design

SRA and Integration

Operational Analysis -- Cable Systems

- ☐ Cable Architecture Requirements
- ☐ Cable System Requirements
- ☐ Data and Voice Terminal Requirements
- ☐ Timing and Synchronization
- ☐ HF/SW Partitioning
- ☐ Secure Interfaces
- ☐ BIT/ BITE Requirements

Operational Analysis -- Radio Systems

- ☐ Radio Architecture Requirements
- ☐ Radio System Requirements
- ☐ Radio Terminal Requirements
- ☐ Antenna Requirements
- ☐ Timing and Synchronization
- ☐ HF/SW Partitioning
- ☐ BIT/ BITE Requirements
- ☐ Secure Interfaces
- ☐ Airborne Radio Requirements

Operational Analysis -- Command & Control Systems

- ☐ Nodal Considerations/Integration
- ☐ Commands
- ☐ Status/Maintenance Requirements
- ☐ Processors/Memory
- ☐ Displays
- ☐ Security
- ☐ Secure Equipment and Interfaces
- ☐ Sub-system Interface Definition
- ☐ Communication Integration/Interface and Controls
- ☐ System Simulation Requirements

Operational Software

- ☐ Higher Order Language
- ☐ POW II Architecture
- ☐ Computer Security
- ☐ Remote Software Change
- ☐ Continuous Aeronautics Processing
- ☐ Real Time Command/Control Processing
- ☐ Compiler Development Support
- ☐ Bench Marking
- ☐ Performance Trade-Offs
- ☐ Airborne Unique Software Requirements

Systems Integration

- ☐ Test Planning Analyses
- ☐ Logistic Support Analyses
- ☐ A & CO Technical Analyses
- ☐ Operational Analyses
- ☐ Maintenance Analyses

System Requirements Development

- ☐ Functional Flow Diagrams
- ☐ Forms II -- Functional Requirements
- ☐ B-1 Prime Item Development Specifications
- ☐ B-5 Computer Program Development Specifications
- ☐ Operational/Maintenance Time Lines

Command and Control Communication and Control Software

- ☐ Operating Systems Including Secure Operating System
- ☐ Communications Software
- ☐ Command Generation and Operational Status Monitoring Software
- ☐ CAMMS Software
- ☐ Code Processing Software
- ☐ Personnel Authentication Software
- ☐ Auxiliary Software
- ☐ Diagnostic Software

Systems Operability

- ☐ Systems Operability Concept
- ☐ Man-Machine Interface
- ☐ Displays and Controls

Processors and Interfaces

- ☐ Processors
- ☐ Bulk Store Technology
- ☐ Processor Interfaces
- ☐ Performance Trade-Offs

C³ Subsystem

- ☐ Data Network Architecture Requirements
- ☐ MF Radio Protocols
- ☐ Fiber Optic Cable Protocols
- ☐ Communications Protocols
- ☐ Message Formats
- ☐ Message Responses

Radio Systems

Communications Measurements and Analysis

- ☐ Wideband Atmospheric Noise Measurements
- ☐ Rough Terrain Surface Wave Propagation Measurements
- ☐ Propagation Analysis
- ☐ Mobile VHF System Analysis/Design
- ☐ Communications System Testing Concepts/Analysis

Radio System Design

- ☐ Higher Order Modulating Technology
- ☐ Error Detection and Correction
- ☐ Spread Spectrum Communications
- ☐ Modeling and Performance Estimation
- ☐ Implementation Feasibility Considerations
- ☐ MF Radio Conceptual Design

Radio Network Design

- ☐ Radio Network Layout
- ☐ Protocols, Routing Algorithms, Multiple Access
- ☐ Simultaneous Operation/Disciplines
- ☐ Performance Estimation, Reaction Times, Survivability
- ☐ Airborne Entry/Control

Antenna Systems

Hardened Antenna Development

- ☐ VLF/MF/HF Buried Antennas
- ☐ Repeater Development
- ☐ Erectable HF Antennas
- ☐ LHF/SHF Surface Terminal Antennas
- ☐ EMP Mitigation Techniques and LSA Requirements Definition

Ground-Based Antenna Systems

- ☐ Wideband MF Broadcast Antennas
- ☐ LHF/SHF Surface Terminal Antennas
- ☐ VLF/HF VHF and UHF Antennas
- ☐ VHF Mobile Radio Antennas

Airborne Antennas

- ☐ MF Trailing Wire Antennas
- ☐ MF Ferrite Loop Antennas
- ☐ VHF/SHF Surface Antennas
- ☐ VLF/HF VHF LHF and SHF Antennas

Cable Systems

Voice Communication

- ☐ Secure Voice-Order Wire Communication
- ☐ Secure Voice-Switched Network
- ☐ VHF Mobile Radio Communication

Data Communication Section

- ☐ Cable Data Network Architecture
- ☐ Cable Network Routing Protocol
- ☐ Network Traffic Modeling
- ☐ Survivable Cable Communication Network

Fiber Optic Communication System

- ☐ Fiber Optic Cable Connectivity
- ☐ Fiber Optic Modern Design
- ☐ Fiber Optic Cable Plant Design
- ☐ Fiber Optic Component Evaluation

Mechanical Systems and Interfaces

Environmental Constraints Analysis

- ☐ NH & S (Mechanical)
- ☐ Packaging Concepts
- ☐ Components/Equipment
- ☐ Test and Analysis
- ☐ Requirements Specification
- ☐ Cable System Requirements
- ☐ Site and Facility Interface Requirements
- ☐ ICD Requirements
- ☐ A & CO Requirements

Security Systems

- ☐ Secure Communications Equipment Integration
- ☐ Computer Security
- ☐ Code Processing
- ☐ Security Studies

Hardness and Survivability

EMP Analysis and Test

- ☐ EMP Analysis
- ☐ SEEMP Analysis
- ☐ EMP Test
- ☐ Requirements Analysis
- ☐ Allocation Analysis
- ☐ EMI/TEMPEST

Radiation Analysis and Test

- ☐ Analysis
- ☐ Requirements Analysis
- ☐ Test

Special Studies

- ☐ Hardness Assurance/Maintenance
- ☐ Subcontractor Support
- ☐ Thermal/Mechanical
- ☐ Fiber Optics

Maintenance Systems

On-Line Maintenance Subsystem

- ☐ Subsystem Design
- ☐ Nodal Requirements Allocation
- ☐ Maintenance Management (EAMMS)
- ☐ Maintenance Monitoring and Control
- ☐ BITE, BIT, SELF TEST Requirements
- ☐ Fault Error Requirements
- ☐ Man-Machine Interface Functions
- ☐ HF/SW Allocations
- ☐ SW Architecture

Off-Line Maintenance Subsystem

- ☐ Intermediate Level/Depot Level MRE
- ☐ RTE Subsystem Design
- ☐ Integration of IL/DL Functions
- ☐ IL/DL Repairable Items
- ☐ IL/DL Test Requirements
- ☐ Test Station Requirements
- ☐ Operating and Diagnostic SW Requirements
- ☐ Test Applications SW Requirements
- ☐ Organizational MRE
- ☐ Requirements
- ☐ Test Equipment -- Fiber Optic, Antenna, ESA
- ☐ B-3 Portable Tester Specs

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Telephone response invited.

For more information specifically regarding the opportunities in Computer/Network Performance Evaluation, you are invited to make a direct phone call to Sam Meals, Manager, Network Performance Analysis Department, at (800) 336-3765 toll free. Otherwise, mail him your resume c/o Dept. M/C-280 at the address below.

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Extensive experience required. The Data Processing Director reports to the City Manager and heads the Data Processing operation of the City.

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EOE



Bostongas SYSTEM PROGRAMMER

Boston Gas has an immediate opening for a Systems Programmer with three (3) or more years experience in operating systems and at least one (1) year in MVS.

The successful candidate will be involved in a VSI to MVS conversion as well as generation and maintenance of the MVS operating system. Other areas of responsibility are tuning and capacity management.

Experience in any or all of the following are a plus: CICS, VSAM, TSO, and PL/I.

We offer a competitive salary and an excellent benefit package. Please send resume and salary requirements to:

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Director-Employment
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- PROGRAMMER ANALYSTS
- SYSTEMS PROGRAMMERS
- QA TEST COORDINATOR

If you are a Programmer Analyst with over two years' experience, a thorough knowledge of COBOL, and have exposure to an IBM environment (OS, IBM 3031, 370/158) ... or if

you are an MVS/OS Systems Programmer possessing a thorough knowledge of BAL ... or if you have previous formalized testing experience, have been an EDP Auditor or programmer, and wish to change career direction ... you could become a member of our professional team working in an aggressive and dynamic environment. A First Time arrangement is available.

Join us in one of these growth positions. We won't waste your time. Call us to arrange for a personal interview, one that will fit your schedule. All calls will be held in strict confidence, and our professional recruitment staff promises to respond to your calls within 24 hours. If you prefer, mail your resume to John J. Scaffidi, 500 Broad St., Newark, N.J. 07102

John J. Scaffidi
Manager of Professional Staffing
(201) 565-3355



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- EDP Quality Assurance Analyst - 19-29K

We offer excellent benefits, salary, and growth opportunities. Please forward an up-to-date resume to:

Jen Alderson
NORTHEAST UTILITIES
P.O. Box 270, Hartford, CT 06101
(203) 666-8911



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NORTHEAST NUCLEAR ENERGY COMPANY

An Affirmative Action, Equal Opportunity Employer

HOSPITAL INFORMATION SYSTEM

The Medical College of Virginia, one of the largest Medical centers on the East Coast, is seeking qualified people to continue development and implementation of a hospital-wide automated information handling system. The facility is located in Richmond, Virginia with easy access to Washington, D.C., Colonial Williamsburg, and Virginia Beach. The positions are with the Commonwealth of Virginia, and require a degree in Computer Science, Math, or Business Administration, and 1-4 years of automated data processing experience. Experience with the TECHNICON Hospital information system or a similar system is a plus. Salary range from high teens to mid twenties based on educational experience.

We offer excellent benefits and tuition assistance at Virginia Commonwealth University. Send resume to MCV Personnel, P.O. Box 86, - MCV Station, Richmond, VA. 23298 or call (804) 788-9429 for more information.

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COMPUTERVISION.

Eleven years ago Computervision had a vision. To go forth where no company had gone before. To venture to push out new horizons to benefit society through increased potential for productivity. And this we have done. In only eleven years . . . with CAD/CAM — Computer Aided Design/Computer Aided Manufacturing

Systems. Today, Computervision's Productivity Systems Division is the recognized CAD/CAM world leader. And the adventure is still in its infancy. Computervision will continue to forge new roads to meet the needs of a changing world . . . through the excellence of our people.

Graphics System Designers/Programmers

We are now engaged in the evolutionary design and development of a Graphics/Information System. This Graphics System is the link between our Operating System and the CAD/CAM Engineering Applications of our interactive graphic facilities.

We seek motivated people with a range of experience from entry level, with a BS in a technical discipline plus at least 1 year of software experience, to expert software development background for the following areas:

DATABASE DESIGN and ACCESS

Information needs include geometric modeling, graphic information and applications-specific information. Requires strength in data structures, data base access method internals, and/or performance modeling.

GRAPHIC FILE GENERATION

From the data base to support interactive design and multi-view engineering drafting needs. Requires strength in mathematics, file organization, and/or compiler and loader design.

INTERACTIVE GRAPHICS MANAGEMENT

To coordinate dynamics, multi-views, user input, and graphic feedback in a multi-device environment. Requires strength in mathematics, control structures, and/or performance modeling.

GRAPHIC SERVICES

For the command interface where interaction handling and visual feedback are provided to aid 2- and 3- dimensional geometric construction and editing techniques. Requires strength in geometric manipulations, control structures, and/or syntax interpretation.

Systems Software

Our hardware/software interactive graphics system includes a state-of-the-art, multi-task, realtime, performance oriented system. The following positions require 2-10 years in operating systems, familiarity with mini-

computers and experience with Assembly language, Pascal, Fortran or PL-1. Nova Assembly/RDOS useful. Requires a BS/MS in Computer Science/Math or equivalent experience.

OPERATING SYSTEMS

Development on both new and current systems in the areas of I/O drivers, device handlers, file managers and networking.

SYSTEM UTILITIES

Development of Editors, Linkers, Compilers and Debuggers. DEC 10/20 experience helpful.

Positions require 2-10 years in operating systems, familiarity with minicomputers and experience with Assembly language, Pascal, Fortran or PL-1. Nova Assembly/RDOS useful. Requires a BS/MS in Computer Science/Math or equivalent experience.

Computervision Corporation offers an excellent benefits package that includes company paid medical, dental, life and disability insurance, retirement program, tuition reimbursement and advancement, and an incentive profit sharing plan.

Please submit resume (including salary requirements and position of interest) to Jeanne C. Hansen, Computervision Corporation, Productivity Systems Division, 201 Burlington Road, Bedford, MA 01730.



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Olamic Systems Corporation invites employment inquiries from data processing professionals with at least five years in-depth experience in the following career areas:

Documentation: Your written and oral communication skills should include the ability to express technical topics in such a manner that your audience need not have any exposure to automated data processing techniques.

Customer Support: Your concern for the customer's welfare will help determine our success in reaching a major share of existing and future computer user marketplaces. Your technical background should include exposure to any of the following network devices: DECsystem 10, DECsystem 20, DECsystem 11 series, VAX11/780, and the PDT 11 series.

Applications Development: Your application skills should be oriented towards providing optimal business solutions at the most competitive price within the shortest possible time frames.

Applications will be developed using the latest database management software and data communications equipment available.

Market Planning: Your challenge will be to help create a total marketing plan dedicated to reducing cost of sales. Your background should include the application of quantitative methodology to advertising, publicity, and sales management.

Please send personal data to:

olamic

Olamic Systems Corporation
Software Services Division
503 N. Euclid Avenue
Bay City, Michigan 48706
(517) 686-7725

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SYSTEMS SOFTWARE PROFESSIONALS

San Francisco Bay Area

Gary Nelson & Associates, Inc. specialize in recruiting Management for Senior Staff Professionals for West Coast technology based companies. Our clients are leading firms providing excellent career opportunities and compensation for systems software professionals.

Current openings include:

- Systems Architect to \$40K
- Network Project Manager to \$40K
- Operating System Designer to \$38K
- Communications Software Designer to \$38K
- Diagnostic Programmer to \$32K
- System Programming Manager to \$45K
- Sr. Systems Programmer to \$40K

We currently have available many additional openings in development and support of operating systems, compilers, communications and data base software, micro code and diagnostics.

We invite you to send your resume or call Mr. Gil Siegel in strict confidence.

GNA

Gary Nelson & Associates, Inc.
10050 N. Wolfe Road - Suite 275
Cupertino, CA 95014
(408) 255-7400

Gary Nelson & Associates, Inc.

Offices in:
Portland/San Francisco/San Diego

DBOMP SUPPORT

Fast-growing mini-computer vendor seeks seasoned support programmer/analyst to enhance DBOMP system. IBM 370 OS or DOS; BAL, COBOL bkgd. pref. Interv. & reloc. exp. paid. Salary \$25,000 range. Fee Paid. Contact Gerry Battista.

Robert Hall of Boston, Inc.
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(617) 423-1200
Personnel Consultants

Programmer/Analyst - Responsible for feasibility studies, analysis, design, coding, testing, debugging, implementation and documentation of automated commercial applications including but not limited to software, simulations, financial, manufacturing, airlines and utilities as an ALLER SERVICES employee on contract to one of our customers. Participate in on-site systems design and programming. Must have experience with IBM 37/OS, Micro Processors, IMS using COBOL, ASSEMBLER, and FORTRAN. Must have ability to communicate with data processing users in determining and effectively producing systems within the stated project duration limits. Must have 3-4 years experience as programmer/analyst. Must have U.S. diploma. \$12.00/hr. 40 hrs/wk. Applicants please submit resume to: Allison Keyes, Manager, Allen Services Corp., 212 West National Rd., Vandalia, Ohio 45377 at 615-886-1200 or 1-800-543-7885.

PROGRAMMER/ANALYST

Rapidly growing company seeks a Programmer/Analyst with 3-4 years experience. NEAT/3 and COBOL for NCR 8450. Online experience preferred, but not required. Send confidential resume and salary history to:

P.B. & S. Chemical Company
P.O. Box 20
Henderson, Kentucky 42420
Attn: Personnel Dept.
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SANTA FE ENERGY COMPANY

Excellent career opportunities exist in the Information Systems Department. We are seeking qualified applicants in search of a fast-moving progressive organization they can grow with. We will be installing a 370/168 6 meg CPU this spring with an intent to upgrade to MVS later this year. The department will undergo major expansion of on-line systems in several areas of company operation during the next two years. These positions offer a challenging environment and the opportunity for personal development and career growth.

Systems Analysts Programmer/Analysts Programmers

Experience is required in systems design and programming using COBOL, FORTRAN, and DBMS techniques. Applicants should have a minimum of two years experience with IBM OS operating systems. Experience with ADABAS and on-line systems is desirable. Personnel with a background in all areas of engineering, production, or inventory systems are needed.

Systems Programmer

We require an experienced MVS systems programmer with a minimum of two years actual experience. A working knowledge of COBOL, FORTRAN ASSEMBLER, OS/JCL, and utilities is required. Experience with data base systems, data communications, VSAM, VTAM, and performance evaluation would be an asset.

We offer competitive salaries and excellent company paid benefits including health, dental, life, retirement and disability. Qualified applicants send resume to:

**Personnel Department
SANTA FE ENERGY COMPANY
One Security Park
7200 I-40 West
Amarillo, Texas 79106**



SOFTWARE PROFESSIONALS

Walt Disney World Company has immediate openings for RealTime Programmers and Programmer Analysts.

REALTIME PROGRAMMERS

Talented software professionals will take an active role in the development of challenging RealTime Mini and Micro Computer Control Systems to support WALT DISNEY WORLD and EPCOT Center.

Strong recent experience in system design and development, with emphasis on energy and transportation, utilizing state of the art hardware and software techniques is mandatory. Individuals should be proficient in Assembly Language and RealTime Multi-Tasking FORTRAN with experience on DATA GENERAL NOVA and ECLIPSE desirable. A degree in a technical discipline is required.

PROGRAMMER ANALYSTS

Innovative programmer analysts with minimum two years recent systems development experience on large scale business computers are needed to take an active role in the design of batch and online business systems using COBOL as primary language.

Qualified applicants should forward resume in confidence with salary history to:

WALT DISNEY WORLD
Professional Staffing FN-25
P.O. Box 40
Lake Buena Vista, FL 32830

Walt Disney World
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INSURANCE FACULTY: Permanent position beginning September, 1980 at the assistant or associate professor rank. Salary range: \$15,935 - \$25,081. Duties include teaching twelve semester hours of undergraduate insurance and related courses or nine semester hours of graduate insurance and related courses or a twelve semester hour combination of both. No more than three preparations per semester will be required. Advising students and serving on faculty committees, assisting in the creation of an insurance concentration and teaching of new insurance courses, participating in other academic or professional activities of the department. Send application to Kenneth L. Shultz, Chairperson, Search Committee, Insurance/IGIS Department, Indiana University of Pennsylvania, Indiana, PA 15705 by May 9, 1980. An Affirmative Action/Equal Opportunity Employer.

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Opportunities in Atlanta

SYSTEMS ANALYSTS

The successful candidates will have a BS or BA in Math or Computer Science, and 2-4 years experience in an EDP operation within an electronics manufacturing environment. Experience on DEC PDP 11/70 using RPG II, Basic and RSTS/E operating system is essential. Responsibilities will include interfacing with users to assist in the development and implementation of manufacturing and financial systems for our Communications Products Group.

FINANCIAL PROGRAMMER ANALYSTS

The successful candidates will have a BS or BA in Business or Computer Science with an accounting background, and 2 years experience with Basic languages. Responsibilities will include designing, programming, and implementing financial systems to payroll, general ledgers, A.P., A.R., cost systems, fixed asset accounting and budgets. Experience with DEC PDP 11/70 and RSTS/E is preferred.

MANUFACTURING PROGRAMMER ANALYSTS

The successful candidates will have a BS or BA and 2 years experience in RPG II within a manufacturing environment. Responsibilities will include designing, programming, and implementing production control systems on DEC PDP 11/70.

Scientific-Atlanta is located in one of the finest living areas in the country, the exciting and progressive city of Atlanta, Georgia - a city which offers an excellent quality of life, recreational and entertainment activities, and affordable housing.

We offer competitive salaries and an excellent benefits package which includes relocation assistance, medical/dental insurance, and an employee stock purchase plan.

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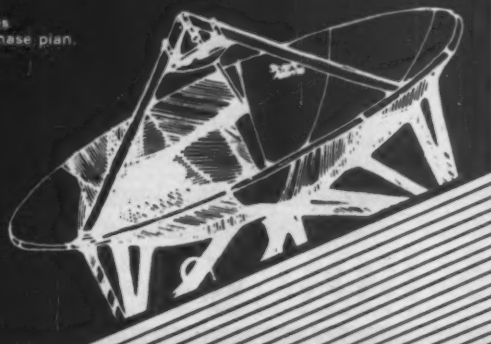
TOLL FREE 1-800-241-5346.

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7 K

Scientific-Atlanta

3845 Pleasantdale Road
Atlanta, Georgia 30340

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Our computing growth can mean your career growth.

Lockheed-California Company is in the midst of an explosive computing growth. And that means opportunity. Lots of it, for individuals with knowledge and experience in any of the following areas:

Hardware/Software Systems Specialists

... to perform evaluations, direct planning efforts, and manage the performance of current and future computing equipment for the company.

Successful candidates should have a minimum of 5 years of data processing experience; knowledge of hardware/software systems; and a BS degree. Experience with IBM equipment, minicomputers, peripheral hardware, distributed systems, and data communication is desired.

Computing Associates (Entry Level)

... to assist senior computing systems evaluators in the preparation of evaluations of computing hardware and software and to gather and report status of information of the evaluations, acquisition and subsequent installation of equipment and software.

Candidates will also assist in analyzing operational data to be used for developing alternative computing systems solutions to meet user requirements.

Successful candidates should have a BS or MS degree in Computer Science.

All positions offer an excellent salary and benefits package that includes free medical, dental, life insurance, retirement plan, and lots more.

Qualified candidates are invited to send resumes to **Dann Locke-DB, Lockheed Employment Office, P.O. Box 551, Burbank, CA 91520** or to call **Duane Bickel, collect, (213) 847-8121, ext. 4043**. An equal opportunity F/M/H/V employer. U.S. citizenship required.

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If you have the experience, the talent and the desire to step up to this level of opportunity now, we want to hear from you. Our Engineering Manager wants to interview you now. Please call **Scott J. Lord** at (617) 449-2000 or rush your resume to him at **Sylvania Systems Group, Strategic Systems Division, 189 "B" Street, Needham, MA 02194**.

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PHILADELPHIA, PA 1700 Market Street (215) 568-0810	PORTLAND, ME 477 Congress Street (603) 773-4749	PARAHUS, KUNHEIM, NYC Suite 906, 140 Route 17, North (908) 967-0051
ROCHESTER, NY One Marine Midland Plaza (716) 939-4610	SOUTHERN CONNECTICUT 140 Sherman Street Fairfield, CT 06430 (800) 255-9145	RHODE ISLAND 1150 New London Avenue Cranston, RI 02910 (401) 463-1660
WELLESLEY HILLS, MA Two Sun Life Park (617) 935-4011		

Or Write William I. Kelly, Exec. VP., 125 High St., Boston, MA 02110

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Programmer Analyst	CICS hospital
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	RPG-Cobol Bank Applications preferred

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Senior Analyst - CICS Systems	\$30,000
DOCS Systems Programmer - 4331 Conversion	\$25,000
Fortran Programmer/Analyst - Energy	\$26,000
Cobol Programmer - MFG. Applications	To \$26,000
IMS DB/DC Analyst/Programmer	To \$29,000
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(713) 780-8810



PROGRAMMER ANALYSTS LEARN CICS & IMS \$23,000 - \$26,000

Are you a Programmer Analyst currently working in a batch environment looking to become involved with Data Base or on-line programming? Our client company, located in suburban N.J., is willing to train qualified applicants in both CICS and IMS DB/DC in a state-of-the-art Data Processing environment. A full range of company benefits includes Major Medical, dental coverage, stock options, prescription plan and much more! If you are interested in obtaining further information concerning this once in a lifetime opportunity, contact: Neil Lang

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(201) 368-0222
(Evening Interviews Arranged)

Paramus, NJ 07652

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We need individuals with 2 to 3 years experience in COBOL, ALGOL, CICS, or IMS DB/DC to work on major software developmental and design projects for our Fortune 500 clientele.

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When you join Cutler-Williams, you will enter the professional environment where you can function optimally, and you will receive the benefits you need to live comfortably.

Positions are available on the West Coast, and in Dallas, Cleveland and Minneapolis. Subcontractors will be considered. Call or send your resume to:

Rich Brzozy
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Cutler-Williams Inc.
Headquarters: 2655 Villa Creek Drive, Suite 205
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TECHNICAL WRITER

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You should be able to write for both technical and user audiences and understand data base application. A background in PL/I is a plus. Send resume to Mr. V. Kulp.

MITROL

MITROL, INC.
One New England
Executive Park
Burlington, MA 01803

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DRI

CREATE EXCELLENCE IN SOFTWARE

Data Resources, Inc., the leading economic information service firm, provides extensive data bases and analytic, modeling, and graphics software in an interactive environment to over 600 corporate, government, and banking clients. Programming at DRI is done in high-level languages, for interactive use by our customers themselves. We believe that such systems are best crafted by small, versatile, highly-motivated teams as opposed to large shops of narrowly-focused technicians.

We seek individuals experienced in working on large projects using structured programming techniques, who are self-motivated, creative, and work well with a team. Knowledge of ALGOL and Burroughs B7700 computers helpful but not required. Sustained growth, new projects, and a view towards the future have created openings in the following areas and locations:

Senior Programmer/Analyst

• To participate in the continuing development of DRI's proprietary software package, EP6. EP6 is an interactive, interpretive workspace language providing econometric modeling and analysis, report generation, graphic display, and data management facilities, as well as generalized programming capabilities. Applicant should have 3 or more years' experience with large software systems and the ability to interface with our in-house users.

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Financial Systems Designer

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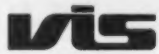
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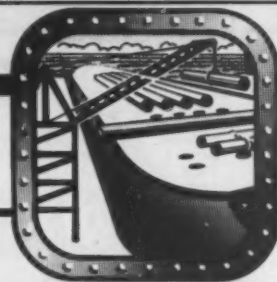
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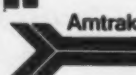
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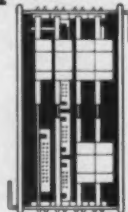
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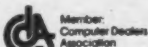
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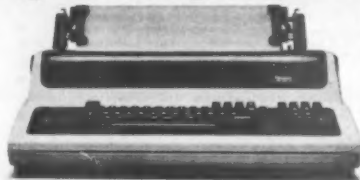
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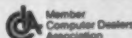
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(1)	IBM 370/155 J + 1 meg CM1	w/3215, 3700, 1433, 1435, 4990, (2) 3360-M3	\$ 25,000	\$950/24 mo.	NOW
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(1)	IBM 3340 B2	—	\$ 16,500	—	5-1, 7-1
(1)	IBM 3630 M2	w/2150, 2151, 6111, 8150	Sub.	\$2,000/12 mo.	5-1
(1)	IBM 5445 M3	—	\$ 6,500	—	NOW
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(1)	IBM 3780 M1	w/7651	\$ 10,000	\$500/24 mo.	NOW
(1)	IBM 3800	w/5401, 8170	\$280,400	—	June
(2)	IBM 3800	w/8170, 1490, 5401, 6148, 8171	\$321,032	—	July
(1)	IBM 5203-3	—	\$ 2,000	—	NOW
COMMUNICATIONS					
(1)	IBM 3717	—	\$ 6,000	—	5-15
(5)	IBM 3276 M2	w/6302, 4621, 6340, 3255, 3256, 3257, 3701	\$ 8,850	—	NOW
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(1)	IBM 3742	w/4004, 6126, 5455	\$ 3,500	\$168/24 mo.	NOW
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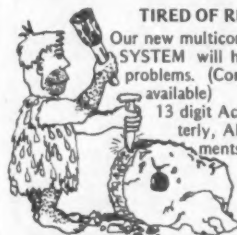
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CLOSING PRICES WEDNESDAY, APRIL 23, 1980

		1979-80	CLOSE	WEEK	WEEK
		RANGE	APR 23	NET	CHG
		(1)	1980	CHNGE	CHNGE
COMPUTER SYSTEMS					
A ANDAHIL CORP	16-69	18	+1 3/8	+8.2	
N BURROUGHS CORP	59-87	88	+2 1/2	+3.0	
N COMPUTER AUTOMATION	9-44	15	+1 1/4	+9.8	
N CONTROL DATA CORP	23-61	52 3/8	+3 1/8	+6.3	
N CRAY RESEARCH INC	8-98	42	-1 1/4	-2.8	
N DATA GENERAL CORP	42-74	57 3/4	+1 3/4	+3.1	
N DATAPoint CORP	17-62	48 1/2	+1 3/8	+2.9	
N DIGITAL EQUIPMENT	39-80	42 7/8	+2 1/2	+4.1	
N ELECTRONIC ASSOC.	2-13	7 1/2	+1	+15.3	
A ELECTRONIC ENGINEERS	9-19	14 1/4	+1 1/8	+8.5	
N FOUR-PHASE SYSTEMS	19-47	22 1/4	+1	+15.3	
N FORBRO	28-44	33	-1 1/4	-3.6	
N GENERAL AUTOMATION	7-26	8 1/4	-1 1/2	-15.3	
N GRI COMPUTER CORP	1-3	1 1/2	0	0.0	
N HEMLETT-PACKARD CO	24-76	86 1/8	+2 5/8	+9.9	
N HONEYWELL INC	43-100	72 3/4	+5 3/4	+8.5	
N IBM	51-321	53 1/2	+2 3/8	+4.6	
N MANAGEMENT ASSIST	9-29	9 5/8	-7/8	-8.3	
N MANUFACTURING DATA S	9-38	39	+2	+7.1	
N MINI-COMPUTER SYST	2-8	2 1/2	0	0.0	
N MODULAR COMPUTER SYS	7-10	10 5/8	-1/8	-1.1	
N NEC	37-81	54 1/2	+1 1/4	+5.4	
N PRIME COMPUTER INC	9-32	18	+5/8	+3.5	
N PERKIN-ELMER	17-47	38 1/2	+1	+2.6	
N SPERRY RAND	33-60	44 1/4	+7/8	+2.0	
N SYSTEMS ENG LABS	11-24	15 7/8	+2 1/8	+15.4	
N TANDEN COMPUTERS INC	13-54	44 1/2	+3 7/8	+8.3	
N TEXAS INSTRUMENTS	78-108	83 1/2	+3 7/8	+4.8	
A VANG LABS.	6-40	30 5/8	+3/8	+1.2	
LEASING COMPANIES					
O BOOTHE FINANCIAL CP	13-21	14 1/2	+1/4	+1.7	
O COMDISCO INC	3-21	8 5/8	+3/4	+9.3	
A COMMERCE GROUP CORP	1-2	1 1/8	0	0.0	
A COMPUTER INVESTS GRP	1-7	1 7/8	-1/8	-6.2	
O CONTINENTAL INFO SYS	2-15	2 1/2	0	0.0	
N DATRONIC RENTAL	1-5	2 1/2	-1/8	-4.7	
A DCL INC	3-8	5	+1/8	+2.5	
N DPF INC	5-14	5 1/2	+5/8	+12.0	
N ITEL	2-38	2 1/2	-1/4	-9.0	
N LEASCO CORP	24-73	61 1/4	-1	-1.8	
O LEASAPAC CORP	1-4	4	0	0.0	
A PIONEER TEX CORP	2-7	2 7/8	0	0.0	
N U.S. LEASING	12-28	12 7/8	+1/8	+0.9	

		1979-80	CLOSE	WEEK	WEEK
		RANGE	APR 23	NET	CHG
		(1)	1980	CHNGE	CHNGE
SOFTWARE & EDP SERVICES					
O ADVANCED COMP TECH	1-3	2 1/2	+1/8	+5.2	
O ANACOMP INC	8-24	12	+3/4	+6.6	
O ANALYSTS INTL CORP	2-18	4	0	0.0	
A APPLIED DATA RES.	7-17	9 3/4	+1/2	+6.0	
N AUTOMATIC DATA CORP	24-40	36 3/4	+1/4	+0.6	
O COMPU-SECURITY NETWORK	5-19	14 1/4	0	0.0	
O COMPUTER HORIZONS	1-9	3 1/4	+1/4	+8.3	
O COMPUTER NETWORK	4-16	4 5/8	+1/4	+5.7	
N COMPUTER SCIENCES	8-24	19 1/4	+1 5/8	+9.2	
O COMPUTER TASK GROUP	1-9	8	-1/4	-4.0	
O COMPUTEX USAGE	2-5	3 1/4	+1/4	+8.3	
O COMPUT AUTO REP SVC	4-10	4 3/4	-1/8	-2.5	
O COMSHARE	6-26	11 1/4	-1	-9.1	
O COLLINS CORP	14-34	29 1/2	+1/2	+1.7	
O DATA DIMENSIONS INC	1-9	1 1/4	0	0.0	
O DATATAB	1-4	4 1/8	0	0.0	
O DSI CORP	4-9	6 1/2	-1/4	-3.7	
N ELECTRONIC DATA SYST	15-28	21 1/4	+3/8	+1.8	
O INFORMATICS INC	9-22	13	+1 1/4	+19.6	
O INSYTE CORP	1-3	3 1/8	+1/8	+8.3	
O IPS COMPUTER MARKET	2-4	3	0	0.0	
O KEANE ASSOCIATES	3-9	6 1/2	-1/2	-7.1	
O KEYDATA CORP	1-5	2	-1/8	-5.0	
A LOGICOM	10-23	17 1/4	-1/4	-1.4	
O NATIONAL DATA CORP	7-19	18 1/4	-1/8	-0.6	
N PLANNING RESEARCH	5-22	6 1/2	+1/4	+5.5	
O PROGRAMMED TASK SYST	3-5	4 7/8	0	0.0	
O PROGRAMMING & SYS	1-1	5 5/8	-1/8	-16.6	
O RAPIDATA INC	3-7	5 1/4	+1 1/8	+27.2	
O RETNOLDS & WETZOLD	10-36	25	-3/4	-2.9	
O SCIENTIFIC COMPUTERS	3-16	12 3/4	+1 1/2	+13.3	
N TSHYRE INC	10-58	44 1/4	+1 1/2	+3.5	
A URS SYSTEMS	9-12	9 1/4	+1/8	+1.3	
N WYLY CORP	1-9	9 1/8	+1/8	+1.7	
PERIPHERALS & SUBSYSTEMS					
N AN INTERNATIONAL	13-32	16 1/8	+3/4	+4.8	
N ANCOR CORP	10-29	17 1/4	-2 1/4	-11.5	
A ANDERSON JACOBSON	5-16	16 3/4	+1/2	+4.8	
N APPLIED DIG DATA SYS	5-22	6 1/2	+1/4	+3.8	
O AUTO-TECH TECHNOLOGY	14-33	28	+1	+3.7	
O REINITE INT'L	4-8	5 3/4	-5/8	-9.8	
A BOLT-BERANEK & NEW	0-22	17 1/4	+1 3/4	+11.3	
O BURKER-RAND	18-32	24 1/2	+2 1/4	+19.1	
O CAMDOME MICROFILMS	1-9	1 1/2	-1/8	-7.6	
O COMPUTER DEVICES INC	9-9	9 5/8	+1/4	+4.4	
N CONTECHNICS DATA CORP	18-54	25 1/2	+1 5/8	+6.0	
O CONTECHNICS	1-4	2 3/4	+1/4	+19.9	
O COMPUTER COMMUN.	4-10	4	0	0.0	
O COMPUTER CONSOLES	4-29	10 1/2	-1 3/4	-14.2	
A COMPUTER EQUIPMENT	3-7	5	-1/4	-4.7	
O COMPUTER TRANSCIVER	1-5	5	0	0.0	
O COMPUTE-VISION CORP	5-58	46 7/8	+5 3/4	+13.9	
N CONRAC CORP	12-26	17	+1/8	+0.7	

		1979-80	CLOSE	WEEK	WEEK
		RANGE	APR 23	NET	CHG
		(1)	1980	CHNGE	CHNGE
SUPPLIES & ACCESSORIES					
A DATA ACCESS SYSTEMS	0-14	10 1/4	+1/8	+1.2	
A DATA PRODUCTS CORP	12-25	13	+1/4	+1.9	
O DATUM INC	2-6	2 1/8	+1/8	+5.5	
O DECISION DATA COMPUT	2-6	2 1/4	+1/4	+12.5	
O DELTA DATA SYSTEMS	1-3	1 3/4	+1/8	+7.6	
N DOCUMENTATION INC	6-34	1 1/8	+1 3/4	+23.7	
O DATABASE CORP	1-37	36 1/4	+3/4	+2.9	
N ELECTRONIC H & W	3-9	3 3/4	-1/4	-6.2	
O EVANS & SUTHERLAND	10-26	23	+1 1/2	+6.9	
O FABI-TEK	1-2	1 1/4	0	0.0	
O GENERAL COMPUTER SYS	1-13	9 3/8	+1/8	+5.9	
O GENERAL DATACOM INC	0-24	13 1/2	-1/4	-1.8	
N HAZELTINE CORP	10-29	22 1/8	-3/8	-1.6	
N INFORMATICS INC	17-39	38 7/8	+1/2	+1.6	
O INFOMEX INC	1-11	1	-1/4	-26.0	
O INFORMATION INTL INC	7-15	11	0	0.0	
O INFOTON	1-4	2	0	0.0	
O INTEL CORP	28-75	61 1/4	+5 1/4	+9.3	
O INTERSIL	7-32	16 1/8	-1/8	-0.7	
A LUNDY ELECTRONICS	4-11	8 1/8	-3/8	-4.4	
O MBI DATA CORP	5-19	6 1/8	-1/8	-2.0	
N MEMOREX	11-59	12 1/2	+1/8	+3.0	
N MOHAWK DATA SCI	8-20	14 1/8	+1 3/8	+19.7	
O OHEX	2-10	10	0	0.0	
O PARADYNE CORP	8-36	22 3/8	+1/4	+1.1	
O PERMEL CORP	5-15	6 3/4	+1/8	+1.2	
A POTTER INSTRUMENT	2-3	1 3/4	0	0.0	
O RANTEX CORP	7-17	11 1/4	-3/4	-4.2	
O RECOGNITION EQUIP	5-13	6 1/2	-1/2	-6.1	
O SCAN DATA	1-5	5 3/8	+1/4	+15.3	
N STORAGE TECHNOLOGY	12-44	13 1/4	+1/2	+3.9	
O SYKES DATATECHNICS	4-31	18	-1/2	-2.7	
O T BAR INC	11-28	23 1/4	+1/4	+1.8	
A TEC INC	3-13	3 3/8	-5/8	-15.6	
A TEKTRONIX INC	33-44	44 7/8	-1/8	-4.0	
N TELEX	3-9	3	0	0.0	
N TESDA SYSTEMS CP	8-26	8 3/4	+3/4	+9.3	
O TIMEPLEX INC	4-14	10 1/4	+3/8	+0.7	
O WILTEX INC	1-2	3/4	0	0.0	
SUPPLIES & ACCESSORIES					
A AMERICAN BUS PRODS	8-12	10 1/8	+1 1/4	+14.0	
O BALTIMORE BUS FORMS	1-4	3/4	0	0.0	
N BARRY WRIGHT	14-34	23 1/2	+7/8	+3.3	
O CYBERMATICS INC	1-1	3/4	0	0.0	
O DUPLEX PRODUCTS INC	7-16	11 5/8	+1/8	+0.8	
N DUNIS BUS FORMS	3-21	14 5/8	+1 3/8	+10.3	
O EMMERSON	43-68	56 3/4	+3/4	+2.0	
O MOORE CORP LTD	28-34	28 1/4	-1/4	-0.8	
N NASHUA CORP	10-37	21 1/4	+3/8	+1.7	
O STANDARD REGISTER	29-29	25	+1/2	+2.2	
A TAB PRODUCTS CO	8-22	8	+1/4	+6.0	
A TABASH MAGNETICS	10-22	11 5/8	+1/4	+2.1	
N WALLACE BUS FORMS	10-33	24 3/4	-3/8	-1.5	

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- ☐ the 2550 (1500 lpm charaband)

- ☐ Serial Interfacing
- ☐ Parallel Interfacing

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